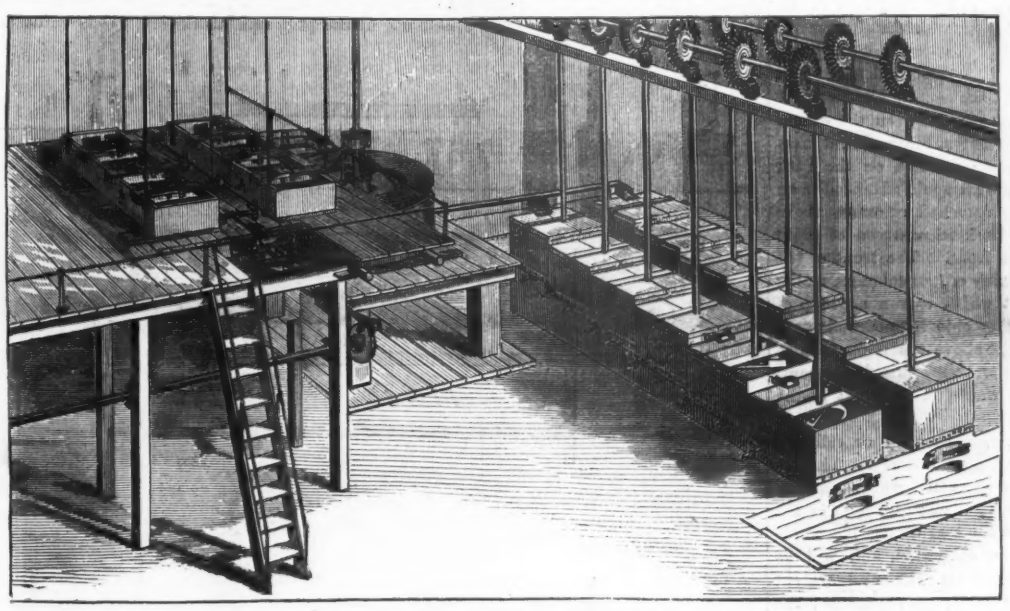
THE ENGINEERING AND MINING JOURNAL.

VOL. IX.—NO. 4.—THIRD SERIES.] NEW YORK, TUESDAY, JANUARY 25, 1870. [SINGLE COPIES 10 CENTS.

Improved Machinery for Separating, Concentrating, and Amalgamating Auriferous Ores.

THE nature of the improvement in working the ores of gold, designed by Dr. S. F. CHARLES, and herewith illustrated, consists in the construction and combination of a series of machines, each depending upon the other, so that in treating auriferous ores, the extraction of all the gold may be effected by a continuous single operation, from the coarser grains to the minute particles, without reducing the free gold to an impalpable powder, and at a great saving of labor and time, as well as an increased yield. The inventor recommends a well-constructed stamp-mill, with a screen of not more than thirty meshes, for crushing the ore, and saving whatever gold can be easily caught in the battery. The pulp passes through a duct, from which it is discharged into the shaking table, shown on the left of the cut, upon the platform. This is made in two divisions, suspended side by side, each being the counterpart of the other. They are of sufficient length, two feet wide, and eight inches deep, and suspended by rods entirely free from obstruction. They are made to vibrate rapidly by the levers shown under the platform, to the right of the ladder, and by other mechanical devices. Their inclination is adjusted by screws. They are also divided into transverse compartments by the bars of iron, which may be moved up and down by hand-screws. The lower part of each bar has its surface grooved at the front edge, so as to form a partially cylindrical cavity, when resting on the bottom of the table. The arrangement and management of this table is claimed by Dr. CHARLES as entirely different from that of any other concentrator. It is simply panning on a large scale, better than it can be done by hand. It is so arranged as to give a strong but smooth vibrating motion, which is communicated to the water, without accelerating the current. The vibration also affects the suspended minerals, giving good opportunity for the metal to sink to the bottom and lodge against and under the curved bars, from which position it can be removed continuously, without stopping any of the rest of the machinery or operations, by simply shutting the gate; stopping the flow of pulp into one of the "panners" at a time; letting on a small stream of clear water through the duct; and allowing a few seconds for washing out portions of the sands. The first front bar is then raised by means of the screw; the metal becomes concentrated at the next bar, and cleaned by the clear water, and so on, gradually, to the last bar. The metal is received in a vessel held beneath. The bars are then replaced and the process repeated on the other "panner," and so on alternately. Only one person is required to attend to both. In this way, a continuous flow of metal is effected at will, while the machinery is kept always clean from settlings. It is well known that a continuous stream of muddy, slimy, or sandy water will prevent gold from settling, and the sand and mud will lodge instead, causing great loss of metal. The tailings from the panners pass in an uninterrupted flow through a second duct into the grinder (see cut), where they are reduced to an impalpable condition. This operation is greatly facilitated by the oscillating motion given to the lower grinder, in connection with the rotary motion. This is claimed to treble the amount of work, and also to bring the mass to uniform fineness. Auriferous sulphurets, the inventor asserts, become so finely divided and polished as to expose the gold, and prepare it for further treatment. From the grinder, the pulp, which is now reduced to impulbable fineness, passes through a third duct into the first of the amalgamators, of which there are twenty-four, in two rows, side by side, twelve in each row. The metal is compelled to pass through the partition to the bottom, coming in contact with mercury.



DR. S. F. CHARLES' IMPROVED MACHINERY FOR TREATING AURIFEROUS ORES.

The cases of these amalgamators are made of boiler-iron, two feet square and two feet deep; but the bottom of each case is of copper, three inches high. The movable partition is six inches from one end, and extends down within about three inches of the bottom, allowing the pulp to pass freely under. At the other side of the partition is suspended a rotary frame, in which are inserted four circular copper pans, three inches deep. The frames holding the pans do not reach further down than three inches from the bottom of the case, so that no other substance comes in contact with the mercury than the fluid metalliferous matter. The copper of the pans and of the bottom of each case is amalgamated—the latter to about one-eighth of an inch—with mercury. The revolving frame with the pans is intended to produce a gentle current, so that the mass is kept moving, and the floating particles of precious metal, as they arise from the bottom around and over the pans, come continually in contact with the mercury in the pans. When the mass reaches the top, it passes through a spout into the next amalgamator, where it descends and rises as before, and so on, through the series of amalgamators.

It is well known that gold needs time for amalgamation. In all stationary apparatus on a horizontal line, no matter how arranged, the muddy water is liable to keep the fine gold in suspension, and it may float off unseen. On the other hand, violent agitation of any amalgamator removes the opportunity for the affinity between gold and mercury to act, and causes a loss of both, finely divided in the water. Many persons, not knowing the extent of this loss, ascribe the small yield of their operations to the poverty of their ores, and many valuable mines are abandoned, while others continue, to the present day, to disappoint expectation, since, in spite of favorable assays, they do not even pay expenses. If it is positively ascertained that the missing gold was in the ore, it must have been lost in treatment.

By the combination and arrangement above described, Dr. CHARLES claims to work very low grades of ores with profit. He uses an excess of clear water in all operations, as fine flour gold will not sink in muddy water. The operation of the panning machines is such that the water seemingly stands still, no current being visible; and it is claimed that with a continuous supply of clear water, all the metal is caused to sink and is arrested. The panning is completed in three minutes. The grinder, with its double motion, is claimed to bring the minerals to the utmost uniform fineness, and, at the same time, to perform a large amount of work. The amalgamators are believed to possess, among many advantages, the great excellences of being at once concentrators and amalgamators, by which the finest metal will be arrested, every receiver keeping a portion, till the pulp is finally deprived of all metallic contents, and the light silicates are washed out. The double set of amalgamators permits the discharge and cleaning of one row, by allowing fresh, clear water to flow in, without stopping the work, as the other row will meanwhile receive the discharge from the grinder. Each amalgamator is provided with a stop-cock for the water, and a lower stop-cock for the the amalgam. Dr. CHARLES asserts that experiments show that the twelfth amalgamator will contain hardly any metal, even after a run of four weeks—an indication that the preceding ones have saved nearly all the gold.

Care is taken to clean the mercury before use; and a constant but moderate heat is kept up under the amalgamators, as a whole, to keep the mercury warm, by which the amalgamating process is greatly facilitated. If any portion of the pulp should not yield its precious metal by the first application, it will be all concentrated in the many different receivers, in a small bulk, easy to be handled again. It can be readily separated from the amalgam, piled up for a time in its waste condition, and exposed to the air, and then again run through the apparatus. This process of natural oxidation and re-treatment is the cheapest.

Further details and explanations concerning the whole plan described in this article, will be given by Dr. S. F. CHARLES, metallurgist, patentee, Hightower, Forsythe county, Georgia.

Ice Mountain in West Virginia.

ON the east bank of the North river, in Hampshire county, West Virginia, is perhaps one of the greatest curiosities in the State. It is literally an ice mountain, in height from four hundred to five hundred feet. The western side of this mountain is covered with loose stone of a light color from base to summit. By romoving the stone, pure, solid crystal ice can be found in the warmest days of summer, and it has been found there as late as the middle of September. It may exist throughout the entire year if the rocks were removed to a sufficient depth. What seems strange is, that the side of the mountain where the ice is found is exposed to the sun throughout the day and it is said the sun does not have as much effect in melting the ice as continuous rains. At the base of this mountain is a spring of water, very clear and cold. Some years ago the owner of the property removed the stone and erected a small log dairy or spring house, in which meats can be kept at any season as safe as they can be preserved in an ice house. Flies and snakes sometimes find their way into the spring house, where they immediately become chilled and torpid. On being removed they soon recover life and motion. This celebrated mountain is situated twenty-six miles northeast of Winchester and sixteen miles from Romney, in Hampshire county, West Virginia.—*Panhandle News.*

[The principle involved in this preservation of ice is the same as that of an artificial ice-house. It is not strange that the sun has less effect than warm rains upon it, since the rays of the sun cannot get at it, but the percolating rains can. The "very clear and cold spring" at the bottom is undoubtedly fed by the thawing ice. That the thawing of a portion produces cold (or absorbs heat) enough to keep another portion frozen, is analogous to the freezing of ice-cream by thawing ice around it.—ED.]

The New Post-Office.

ITS ARCHITECTURAL DESIGN—FULL TECHNICAL DESCRIPTION.

MR. MULLETT, supervising architect, has perfected the plans for the new United States Post Office building in the Park, and we give a full description of its architectural features:

The building occupies the triangular lot at the southern end of the Park, at the intersection of Broadway and Park row. The southwest end or apex of this lot is truncated so as to give a front of one-hundred and forty-four feet, facing down Broadway. On the north, that is in the rear, the Government has reserved a street, or rather an enclosed court, twenty-four feet wide, between the Post-Office and the Park. This street will give access to the United States Courts, which are placed on the north or Park front of the building, and will be used for the receipt and delivery of the mails, and at the same time protect the Government against any future difficulties, should the Park be sold or devoted to other uses.

The building thus has an extended front of two hundred and seventy-nine feet toward the Park, two equal lateral façades of two hundred and sixty-two and a-half feet on Broadway and Park row, and a front of one hundred and forty-four feet at the southwestern extremity, facing the Battery, from which the central pavilion projects further toward the front. The main cornice is eighty feet above the sidewalk. The style of the building is Renaissance, the treatment of the roofs French. It will be three stories high in the walls, with a fourth story in the roof. The centre of each façade is occupied by a broad projecting pavilion with a high massive roof, and the oblique angles at the corners are masked by smaller pavilions polygonal in plan, whose boldly detached roofs hide and mask the awkwardness of the angles. The walls will be of Maine granite, from the quarries at Dix Island, near Rockland. The

exterior ordinance consists of three Doric orders superposed, treated with increasing richness from the ground to the cornice. The lower order is simply a rusticated arcade, continued round the entire building, and supported on high plain pedestals. Above the first storey the orders are continued in the pavilions, but omitted on the curtains which connect them. The second order is enriched with a dentil course, and the crowning entablature with both mutules and dentils metopes, carrying rich pateræ. The windows throughout are semicircular-headed, the archivolts, ornamented with keystones, are carried on projecting pilasters whose imposts are continued across the piers. A stylobate is carried round the building at each storey, broken by balustrades under the windows.

The central pavilions on Broadway and Park row are fifty-six feet broad, and ornamented by a two-storied colonnade of eight detached columns. The upper order carries a sculptural pediment from which rises a pyramidal roof crowned by a balustrade one hundred and thirty-five feet above the pavement. The front of this roof is relieved by a large frontispiece or Lucerne, ornamented with columns and scroll buttresses, and carrying a double-arched window surmounted by a clock over which bends an arched cornice crowned by the American arms. The roofs of the lateral wings or curtains, and of the corner pavilions, are broken by smaller dormers with pedimental caps, those on the pavilions being enriched with an order.

The façade on the north or Park front is appropriated to the United States Courts. The central pavilion of this front is eighty-seven feet six inches broad, containing five bays or intercolumniations, from the three middle ones of which projects a colonnade similar to that on Broadway, but carrying a pediment surmounted by a group of emblematical sculpture and lateral pedestals, crowned by eagles. Above the principal cornice on the attic storey, enriched with Corinthian pilasters, rises to the height of the main roof, carrying a plain pediment and a grand Lucerne like those on Broadway and Park row fronts. Behind this springs a dome seventy-five feet in diameter and reaching to one hundred and sixty feet above the pavement. The dome is square in plan, but truncated in the angles, and raising to an octagonal deck, which is surrounded by a balustrade. Pedestals carrying the national arms buttress the ribs of the dome at the angles of the base, and four small circular windows are grouped around the central Lucerne.

On the southwest front the whole space between the corner pavilions is thrown forward twenty-one feet into a central mass of the same breadth as that of the main pavilion on the Park front. The three middle bays of this are again advanced in an open two-storied portico of sixteen detached columns, above which the third order is thrown back in a screen of eight columns, also detached, against the front. The front of the portico is brought forward in a balcony of four columns, and in the second storey with a pediment which carries a group of allegorical figures, balanced in either side by pedestals supporting the national arms. The attic above the main cornice is ornamented by twelve Caryatides and a sculptural pediment. The dome, which surmounts the whole, is like that of the Park front, already described.

Within, the building contains a sub-basement or cellar, a basement, three upright stories, and a roof storey. The exterior walls will be supported on piers of granite masonry resting on a broad bed of solid concrete. To give light to the basements, and to provide room for the coal vaults, the whole area under the sidewalk has been excavated, and will be covered, for the greater part, with Hyatt tile. The sub-basement will contain the heating and other cumbrous apparatus; the basement will be used for the rougher work of the Post-office. Greater light is secured in this storey by carrying the curtain-walls of the Broadway and Park row fronts on iron columns.

The General Post-office occupies the whole of the ground floor, the inner walls throughout being carried in this storey on iron columns, so as to leave the area unbroken by partitions excepting for the boxes. The mails will be received and delivered to the wagons on the northeast front or part, an ornamental roof or awning of glass and iron being thrown out for protection while being received or discharged. The public corridor occupies all the other fronts, having seven doors each on Broadway and Park-row, and three in the south front.

The distinguishing feature in the arrangement of this Post-office, as of that in Boston, is the introduction of a *mezzanine* or half storey above the public corridor; this *mezzanine* is made simply a gallery open to the interior of the Post-office room; so that while the public corridor occupies the whole exterior on three fronts, the windows of the *mezzanine* admit air and light directly to the Post-office within. A triangular court occupies the interior of the lot; this, on the first floor, is glazed over, and forms part of the Post-office storey.

Four large ventilating shafts, around which are grouped the water-closets and secondary staircases, ventilate the large areas and support the angles of the inner walls, while separate ventilating shafts are provided for the Court Rooms.

Above the first storey the north front is devoted, as has been said, to the United States Courts. These are reached by two large elliptical stairways in the corner pavilions, which are entirely shut off from the rest of the building. The remainder of the upper stories is reserved for the various uses of the Post-office, the Postmaster and Deputy Postmaster occupying rooms in the south front on the second floor and *mezzanine*. The main stairways for this part of the building are in each side of the south doors, the corner pavilions being converted into small rotundas in the corridor, and circular apartments above.

Rail Joints.

THERE has been a substantial improvement made in joining the ends of rails within the past few years. From the heavy cast-iron chair within the rail laid directly upon the metal, to the improved fish-bars where the rails are held partially in suspension, and to the Reeves suspension joint, where the rails are held intact, and not weakened by drilling or punching, is a long step in the right direction. The different forms of the fish-bar give a certain amount of elasticity and relief to the joint, and though the bolt holes through the web detract from the vertical resistance to the weight of the train, they leave the track for the time in favorable condition for easy movement. All these arrangements, however, with the exception of the Reeves suspension joint, have the defect of weakness, and after a few months of wear, unless extra care is taken, the nuts of the bolts become loose and the wheels become noisy. A remedy for the unscrewing of the nuts is found in using Gibbons' Union Stop Washer, a very simple and inexpensive protection. The joint should be as strong as any other part of the rail, and real substantial economy is only subserved by insisting upon this condition. The compound fish-bar or splice, of wood and iron, though working well for a time, has this defect of weakness, and eventually must give way to some arrangement more permanent in character. The common forms of rail in use are not favorable to the application of the common fish-joint. An increase in depth to four and a-half or five inches is needed to give the splice its best conditions, especially where the rail has to be punched or drilled, and where locomotives are carrying from four to six tons weight on a wheel. In using the Reeves' joint the rail does not require such depth of section, but the general tendency among managers who have plenty of money to expend, is to have rails of greater depth of section, and we shall not be surprised to find eventually that five inches will become the standard depth. When iron chairs are used, a thin strip of well-seasoned wood, or some other slightly elastic material, should be interposed between the rail and the chair. This may be made of boiler felting, rubber, or wood; and, to keep it in place, a cap of thin boiler plate, nicely fitted to the bed of the chair, and flanged over at the ends, has been found to be very efficient in relieving the heavy hard blow of the driving wheels. If railway managers, master mechanics, and track masters, should give due attention to the effect of passing trains upon the different joints in use upon their roads, noting at the same time the condition of the track at the joints, with the determination to make the best use of the plan and material on hand, they would be surprised to see how many elements of active destruction, some of them unnecessary, they will find. No matter how good the joint is, it will prove practically worthless if the cross-ties are not kept tamped up in plane; where the driving wheel sinks down half an inch or more in passing a rail joint from the want of tamping, every condition of economic operation is violated. Any defect of this kind in the track re-acts upon the wheels, wearing them out of a perfect circle, and the disturbance is thus carried to every portion of the rolling stock. The base of all economic operation is the track; the smoother and firmer it is, especially at the rail joints, the less the repair expenses of every department. A little defect in the track ought not to be allowed a moment. A shaky rail joint is the parent of a great deal of expense, and many possible disasters; and while we must not expect the best results from the many inefficient devices in use, we are very certain that, with due care and attention, much better results as to safety and economy may be secured than many of the managers seem to be contented with. —*American Railway Times.*

Gold Diggers of Thibet.

THE Thibetan gold field of Thok-Jalung, in latitude 32° 24′ 26″ and longitude 81° 37′ 38″, has been visited by a corps of scientific English explorers, who have just published an account of their observations. Their camp was pitched in a large desolate plain of a reddish-brown appearance; the tents stand in pits seven or eight feet deep, for protection against the cold wind, the elevation being sixteen thousand three hundred and thirty feet; yet the diggers prefer to work in the winter, when nearly six hundred tents are to be found there. The soil when frozen does not "cave in." They have no wood, but use dried dung for fuel, and the water is so brackish as to be undrinkable until frozen and remelted. They live well, taking three meals a day of boiled meat, barley cakes, and tea stewed with butter. They will not use the Himalayan tea, as it is too heating and only fit for poor folks.

The gold is obtained from an excavation a mile long, twenty-five feet deep and ten to two hundred paces wide, through which a small stream runs; the implements used are a long-handled kind of spade and an iron hoe. The water is dammed up, and a sloping channel left; at the bottom a cloth is spread, kept down by stones, so as to make the bottom uneven. One man sprinkles the auriferous earth over the channel, and another flushes the channel by means of a leather bag, the pieces of gold fall into the inequalities, and are easily collected in the cloth by lifting up the stones. The yield is large; nuggets of two pounds weight are found; the gold sells on the spot at rather less than thirty rupees per ounce. A gold commissioner or "sarpon" superintends all the gold fields, a string of which extends along the northern watershed of the Brahmaputra, from Lhasa to Rudok. Each field has a chief or master, but any one may dig who pays the annual license-fee of one sarapoo or two-fifths of an ounce.

The curious posture for sleeping, universal among the Thibetans, was observed here. They invariably draw their knees close up to their heads, and rest on their knees and elbows, huddling every scrap of clothing they can muster on their backs; the richer rest thus on a mattress rising towards the head. The poorer avail themselves of a suitable slope on the hillside, or pile stones and earth to a convenient height. This position is most probably adopted in order to secure as much warmth as possible for the abdomen, the thighs pressing against it and excluding the air.

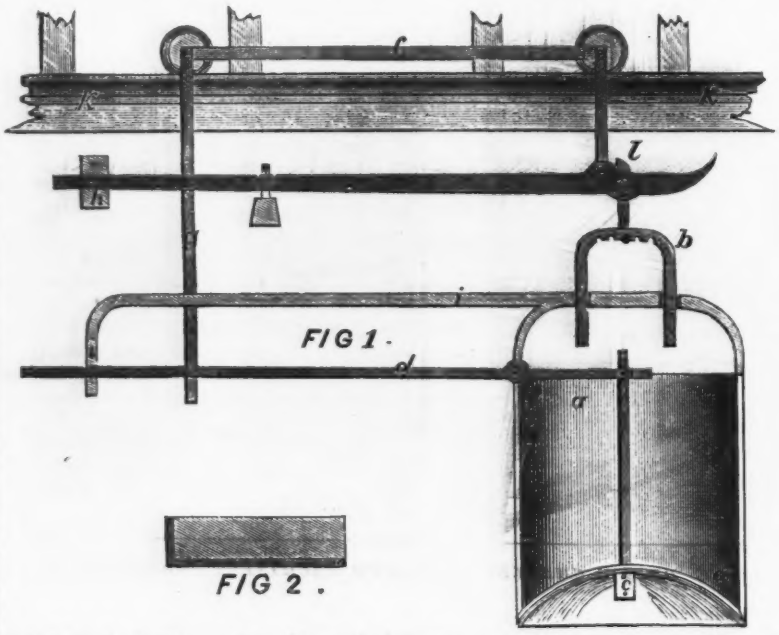
The gold-diggers recreate themselves with tobacco smoked in iron pipes, and notwithstanding the hardships of their laborious toil, seem very merry, singing songs in chorus, in which the women and children join.

American Mining and Metallurgy from a Foreign Standpoint.

Notes of a Tour of Observation, by Professor F. STAPFF, of Sweden, Special Correspondent of THE ENGINEERING AND MINING JOURNAL.

II.

THE charging-funnel of the Missouri blast-furnaces, alluded to at the close of my last letter, consists of the cylinder, *a*, (FIG. 1), the loose bell-bottom of which, *c*, falls down as soon as the lever, *d*, is released. This cylinder, with its appurtenances, is suspended from the centesimal balance, *e*, by the hook, *b*. The little wagon, *f*, running on the hanging tramway, *k k*, bears both the balance and the double bars, *g*, by which the balance-arm, *e*, and the lever-arm, *d*, etc., are guided. By the counter-weight, *h*, the cylinder, *a*, and all connected parts, are put in equilibrium, once for all. The nose, *l*, prevents the balance-arm from being jerked up, when the cylinder is suddenly emptied. When the lever-arm, *d*, is fixed at the guide-bar, *i*, the ore-charge can be weighed, as on a common centesimal balance, the cylinder, *a*, serving as a scale. The whole apparatus is then rolled over the furnace, and the bell, *c*, lowered by releasing the lever-arm, *d*. The ore is guided over the bell against the walls of the furnace, where it is deposited in the shape of a regular concentric ring, if the center of the bell was situated in the axis of the furnace. But by approaching the cylinder more or less to either side of the furnace, an unsymmetrical distribution of the charge can be effected.



At Pilot Knob, Iron Mountain, and Lockridge, where these chargers have worked satisfactorily for ten or twelve years, the cylinder is half filled with six hundred to seven hundred tons of ore. It has a height of about two and a quarter feet, a diameter of about two feet; and the height of the bell is about six inches. Between the outside of the cylinder, when centrally suspended over the furnace, and the inside of the gas-cylinder at the furnace-top, there is an annular interval of about one foot.

Charcoal and limestone are, at the above-named furnaces, charged in the usual manner, by cars and troughs, as uniformly as possible all over the furnace. At one of the Kingsland furnaces (Carondelet, Mo.) coal, lime and ore were charged, over a bell covering the furnace-top, of which more in the sequel.

As I visited the Kingsland establishment, after despatching my former letter, you will allow me to insert here some observations recently made at that place, about ore and coal, etc. The Kingsland furnaces use Iron Mountain ore, averaging about sixty-five per cent; according to another statement, sixty per cent. These ores run rather "dry," and make red-short iron, when used alone, but by the addition of about one-fourth hematites, a very good furnace-run and neutral iron are obtained. Rolling-mill cinders are used, together with the Iron Mountain ore, in the proportion of one to thirty. The flux is an apparently pure, dense, crystalline, grey-white limestone, from the surrounding strata, belonging to the coal-measures. The fuel is about 2-7 Pittsburgh coke, and 5-7 Illinois coal. This Illinois coal is soft, not baking, and by the absence of visible pyrites and shale, highly distinguished from the common South Illinois coal. It costs at St. Louis, from nine to fifteen cents a bushel. The Iron Mountain ores are burnt in piles, as is done at Iron Mountain, Pilot Knob, etc. Ores and limestone are crushed by a Blake stone-breaker, and coal and coke are charged in smaller lumps than commonly at large American blast-furnaces.

Albeit the careless charging of blast-furnaces may be less

injurious in results for large furnaces than for smaller ones, it seems to me that there is too much negligence in this respect at most of the American (and European) coke and anthracite furnaces; while, on the other hand, perhaps too much pains is taken at many of the Swedish and German charcoal furnaces, to put each shovel-full of ore or lime at a certain spot in the furnace.

In speaking of charging blast-furnaces, I must mention the excellent charging balances of Messrs. BANKS, DINSMORE & Co.'s scale-works, Pa., which are in use at the Anderren and Kingsland furnaces. The cars loaded with the different kinds of ore, lime, or coal, run over and are weighed on one and the same balance-platform, before reaching the hoist. A number of beams (four at Anderren, nine at Kingsland) can, independently of each other, be connected with this platform. Each of them is loaded with a weight, corresponding to the charge of ore, etc., to be weighed when this beam is in connection with the platform. As all beams are enclosed in a locked screen, the position of the weights on the beams can be changed only by the key-keeper. The desired connection between any of the beams and the platform is easily made by pulling a little hand-lever, which extends outside the screen. Besides, each beam is furnished with a pointer, also visible outside, and showing if the loaded car on the platform has the desired weight or not. In weighing, the loaded car is pushed on the platform; the lever marked with the name of the substance to be weighed is pulled; and the load is reduced or increased, until the pointer indicates the right weight. As the advantage of weighing furnace-charges is rather dubious unless the weighing is done with conscientiousness and accuracy, the arrangement of Messrs. BANKS & DINMORE seems to be of a high practical value, facilitating the work of the weigher, while making it impossible for him to alter the position of the weights on the beams.

CONSTRUCTION OF BLAST-FURNACES.

As some of the adjoined cuts, showing sections of high furnaces, are sketched after verbally communicated figures, and not copied from existing drawings, they may perhaps be erroneous in some small details, but nevertheless, I think they will afford a correct general impression.

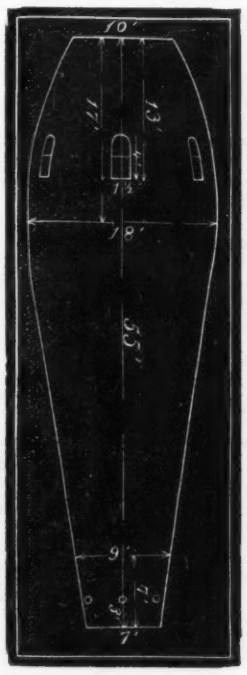


FIG. 3. Anderren No. 3, Anthracite, 5 tuyers @ 4 in.

At Anderren, originally two furnaces of forty-two feet were built, and one of them afterwards heightened to fifty-five feet. But the third and newest of the Anderren furnaces was made from the start fifty-five feet high, as indicated by the cut. The forty-two foot furnace is always kept charged to the top, while the fifty-five foot furnaces are allowed to sink about a yard before a new charge. The third furnace has six gas-holes opening into a channel, which surrounds the furnace and is covered with iron plate. A short chimney of sheet iron, beginning a few feet above the furnace-top, causes a current of air from all sides to pass over and refresh the workmen. The old furnaces have three tuyers, the new one five, of four inches diameter. The outside material of the old furnaces is hewn stone, that of the new one brick. Inside all are lined with fire-brick.

Of the three furnaces at Bethlehem, one is filled with Lurmann's patent cinder-block, but was not in blast when I visited the place. The Bethlehem Furnace No. 2 (see cut) has eight three-inch tuyers, of which only six are used; furnace No. 1 has the same dimensions as No. 2, the height excepted, which is fifty feet, and seven tuyers, of which five are in use. The Bethlehem furnaces also are furnished with short chimneys; but these begin immediately over the furnace-top, and there are in each three wide holes for charging the furnace. The new and elegant establishment at Hokendauqua possesses three furnaces, fifty-five feet high, seven feet on the top, eighteen feet bosh, ten feet hearth; and one furnace sixty feet high, seven feet on the top, eighteen feet bosh, and twelve feet hearth. These have seven tuyers and chimneys, as at Bethlehem. Similar are the three old furnaces of Catasauqua and the new ones of Lockridge. As a very good arrangement of Mr. THOMAS'S, may be named the lining the upper part of the furnaces (down to the gas-holes) with cast iron. Each brick is covered on the outside and bottom with an iron shoe, as indicated by the cut (FIG. 2). The furnace-gases at Hokendauqua and Lockridge are caught in the same way as at Anderren and Bethlehem; but one of the Hokendauqua furnaces is furnished with a bell fixed close below the furnace-top, and (as already said of another place) designed to guide the charges against the walls of the furnace. As a broad, annular interval remains open between the border of this bell and the walls of the furnace, it does not seem probable that the quantity of gases taken from the furnace is increased by this arrangement. All the furnaces hitherto named use anthracite magnetites and hematites.

The two furnaces of SCHONBERGER & Co., Pittsburg, of brick covered with sheet iron, were said to have forty-five feet height, thirteen feet bosh, and four and a half feet hearth; one of them used five, the other three tuyers. Rich magnetic and specular iron ores are smelted here with coke.

Kingsland's two furnaces (Carondelet) have sixty feet height and fourteen feet bosh, are built of brick, covered with sheet iron. The inside lining is of fire-brick, but sandstone is employed around the hearth. There are eleven four-inch tuyers, one of them over the tymp. The gases are caught by gas-holes and surrounding channels; and one of the furnaces is closed by a conical bell, which is lowered as soon as the charges are dumped upon it. The interstices between bell and furnace are packed with ore-smalls and coal-dust. The bell is of sheet iron, and liable to be warped. This is the reason why it has been removed from one of the furnaces. It was stated that no considerable increase of gas was made by this arrangement, which caused plenty of smoke and tar. But I found it quite cool around the covered furnace, and at the same time very hot around the other one, which was furnished with a chimney with three holes. No alteration in the furnace-run had been observed, whether the furnace was open or covered. These furnaces use coke, Illinois stone coal, and Iron Mountain ores.

The dimensions of the Pilot Knob and of the two now-existing Iron Mountain furnaces—a third furnace at Iron Mountain has been pulled down—are inscribed in the cuts. The Pilot Knob furnace has three tuyers, the two Iron Mountain furnaces only two each, of three inches diameter. The capacity of these latter furnaces is 1,100 and 1,150 to 1,175 bushels of charcoal respectively. The fine charcoal furnace of Irondale was just blown out when I visited the place. It is thirty-nine feet high, and has a base of ten feet. All these furnaces are built of hewn stone, and lined inside with fire-brick, except the hearths, which are lined with sandstone. One of the Iron Mountain furnaces made its second campaign on the *same* hearth, which, after the first campaign of five or seven months, was burnt out from its original width of three and a third feet to about four feet. All Missouri charcoal furnaces are furnished with sheet-iron cylinders, hanging four feet down in the furnaces, by which a number of gas receivers, of six inches width and four feet depth, are formed between the cylinders and the walls of the furnaces. The experiment had been tried of covering one of the Iron Mountain furnaces; but the gas thus obtained turned out to be rather cool and incombustible smoke. It should be here recollected that one-tenth of the charcoal used at the Missouri furnaces is "brands;" and that the charcoal is sometimes used wet. On the top of the Missouri furnace-chimneys are erected with only one charging hole.

FIG. 4. Bethlehem No. 2, Anthracite, 3 tuyers (6 used) @ 3 in.

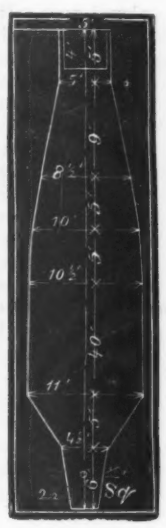


FIG. 5. Pilot Knob, Charcoal, 3 tuyers, @ 3 in.

FIG. 6. Iron Mountain No. 2, Charcoal, capacity 1100 bush., 2 tuyers @ 3 in.

FIG. 7. Iron Mountain No. 3, Charcoal Capacity 1150 to 1175 bushels, 2 tuyers @ 5 in.

I do not recollect the exact dimensions of the Newark spies geleisen furnaces, which are small, and similar to the German so-called "Blauöfen. Lürmann's patent had been tried at one of them, but taken off again Although these furnaces are run with anthracite, their trifling height seems to be rather a good arrangement, as the rich ores from the zinc-white furnaces yield almost all iron in metallic state, and low furnaces are not so easily obstructed by zinc vapor as high ones.

With regard to the general plan, and the care and architectural taste, shown in the iron-works I have named, most of them seemed to me to equal and surpass the European ones. It is quite natural that old American establishments should have received, by later enlargements and improvements, a somewhat irregular shape; but their fitness for the purposes of profitable business is not thereby reduced. The modern establishments of Hokendauqua, Lockridge, Kingsland, Irondale, etc., are fine monuments of American enterprise and genius, of metallurgical, mechanical, and architectural skill, of taste, and of capital well employed.

MACHINERY.

I think that the Europeans have much to learn from the Americans with regard to the construction of motors and working machines. It may be that many of the American machines are constructed without much consideration of the laws of theoretical mechanics; but one must admire the audacity with which new ideas are here realized; the skill of the draughtsman and constructors, and the success with which the Americans have substituted machiney for hand labor of every description.

I might fill volumes with descriptions of the fine machinery at American iron-works; but I cannot enter the field of details, since I have passed too hastily through most of the iron-works to fix in my memory all those small, ingenious dispositions, which are seen with delight, but easily forgotten. The machines met with at almost all furnaces are hoists, blast engines, water-pumps, and (at some) stone-breakers. At none of the works I visited was natural water power directly used for driving these machines. Everywhere one meets with steam engines, fired by the furnace gases. The boilers used were common cylinder boilers; boilers with two interior flues, and so-called French boilers, with tubes below the main cylinders. At many establishments the boilers are arranged close below the furnace tops, upon arched floors or (at some older works) upon carpeted beds, covered with brick. This disposition allows the height (and cost) of chimneys to be reduced; but on the other hand, the cost and risk of it causes large and high pillars, arches, and floors for supporting the boilers in these modern Babylonian gardens, and the employment of long steam pipes leading down to the blast engines. These may be the reasons why boilers of a more recent date (*e. g.*, those at Kingsland, at the newest of the Anderren furnaces, etc.,) have received a lower position by the side of higher chimneys. At Anderren, thirty-two boilers (twelve of them commonly under cleaning) giving steam of forty-five pounds pressure, are fired by the gases of three furnaces; at Hokendauqua, twenty-two boilers (most of them French, of eighty feet length and three to four feet diameter,) giving steam of forty pounds, are fired by the gases from four furnaces; the Pilot Knob and Iron Mountain charcoal furnaces furnish gas fuel for two tubular boilers each. At Hokendauqua, six French boilers are generally fired in one oven, without walls between the different boilers. Along their front runs a channel, from which the flame is spread over a fire-bridge about eight inches broad, common for all boilers, and close below them. Behind this fire-bridge the oven is very spacious (about six feet deep below the boilers), and terminate with a channel over against the boilers, from which the smoke is conducted to the chimney.

HOISTS.

The Missouri furnaces, and three of those at Johnstown, are so situated at the foot of hills, that their tops are level with the fuel and ore yards, whence they are directly charged. At Johnstown, a railway track around the ore-bearing hills receives the cars from the different adits and tunnels. The cars are dumped behind the furnaces, where the ore is roasted in heaps sixty to seventy feet high, extending along the hill side. These heaps have their bases on the coke-yard, level with the tops of three of the furnaces. The coal is brought by a special (lower) track along the hill, and by slopes this track is connected with the main railroad in the valley and with some coal mines. By a special hoist the ore, etc., is lifted from the coke-yard level to the top of the seventy feet furnace. The Pilot Knob furnace, also, is situated close at the foot of the ore mountain. From the main ore quarry a slope is established down the mountain, with terminus over the coal and ore yard, behind the furnace, and level with its top. The ore-cars coming down the slope are carried over wooden bridges, and tilted from these on the roasting heaps. Coal and lime are by teams brought to the coke yard. Quite similar is the arrangement at Iron Mountain. One railroad track around the ore mountain receives the cars coming down from the different quarries, and conducts the ore to the top level of the roasting piles. By another track the slopes from the quarries are connected with the St. Louis Iron Mountain Railroad.

At all other establishments which I have visited, coal and ore are tilted at the foot of the furnaces, mostly from special branch tracks, supported on bridges, some fathoms above the ground. The machines used for lifting the charges to the furnace tops at Bethelehem and Hokendauqua, are pneumatic hoists. At Bethlehem, the platform is suspended on two wire ropes. Each of them runs over a pulley, and is joined with the heavy pistons, which move in rather narrow-bored vertical cast iron pipes on the side of the platform guide-bars. The driving cylinders are put together in five feet pieces, which are joined by snouts, collars, and screws. The stuffing-box is filled with gutta-percha cords, curled around the wire rope, which serves as a piston-rod. The air moving the pistons has commonly a pressure of five pounds, but a less pressure suffices. At Hokendauqua, only one driving cylinder, of forty-two inches diameter, is used, and of course only one wire rope, which is tightened in the stuffing-box, in the same way as at Bethlehem. The common pressure of blast is five pounds; but less would be sufficient. For lowering the platform, it is sufficient to blow out the compressed air from above the driving piston; the platform will then descend by its own weight.

TO BE CONTINUED.

CORRESPONDENCE.

Santo Domingo.

LETTER FROM PROFESSOR W. M. GABB.

SANTO DOMINGO, December 16th, 1869.

TO THE EDITOR.—Sir: When I was in New York last summer, I promised that as soon as I had an opportunity of becoming well acquainted with any large region of this island, I would commence giving you an account of it, particularly with reference to its geological and mining features. The time has now

come when I feel under obligations to redeem my promise; the more especially, since recent political events are calling in this direction public attention in the United States, in a manner that will make any reliable information of especial interest.

But before I begin, justice to myself requires that I shall say something, whether as explanation, "defining my position," protest, or whatever you desire to call it. During the early and middle parts of this year, innumerable statements found their way into the papers, for the truth of which I was quoted as authority. I was represented as saying that Santo Domingo was a richer gold field than any known part of California or Australia; that I had washed, or had seen others wash, (I forget which) ounces of gold per day, with a pan, and was made responsible for other assertions which, to any person conversant with gold mining, bore on their face the evidence of falsehood or misrepresentation. Now I wish here, once for all, to repudiate all statements that have appeared in the papers heretofore. I have never written, nor authorized others to write, for print, any account about the mineral prospects or wealth of the island.

Starting with a clear record, I now propose to send you, from time to time, what I know to be facts, and for which I hold myself, personally and professionally, responsible. Our work, in the geological survey, requires us to visit in succession every part of the Republic, and we thus have opportunities of learning all of its features, good and bad, in a manner more thorough than comes within the means of any casual visitor to the country. Up to the present time, except a single flying trip across to the north side of the island, our work has been confined to the Province of Santo Domingo, and, except by report, we have had but little opportunity of learning much of the country beyond its boundaries.

Among the numerous impediments with which we have to contend, and which combine to render our progress very slow, may be mentioned bad roads, dense forests, the ignorance of the natives, with their entire inability to give us any information, and, in the mountains, the heavy rains, continuing long after the dry season has set in in the lower country. Of the first of these, it would be better to say that there are *no* roads. This is practically the case, if we define the word according to an American or European standard. In the immediate vicinity of Santo Domingo City, and again directly around Santiago, there are some broad cuttings through the brush, where, in dry weather, carts can go; but in the interior, a "good road" is a horse trail, not more than a foot deep in mud, and wide enough for a pack animal to squeeze through.

While there are large open tracts, covered with grass, many miles in extent, the greater part of the island is covered with primeval forests, dotted here and there with little hamlets, or more often, groups of two or three houses only, each family having its "clearing" of an acre or two in extent, securely fenced against the pigs and planted with yams, sweet potatoes, plantains, yucca, melons, coffee, cane, etc., etc. So great is the fertility of the soil, that a couple of acres thus planted, supplies, with a little pork, all the food for a large family. To get from one of these settlements to another, the traveller has often to procure a special guide, who trudges along on foot, lopping off the overhanging branches from the trail, his "machete" or long wood-knife plying from side to side, with as little apparent effort as the wagging of a dog's tail. The horse flounders along, fetlock-deep in mud, or stumbling over the tree roots, and two or three miles an hour is pretty good travelling. All this is, not that roads here must necessarily be bad, but because a road is simply a line through the forests, along which the brush is cut out, and where the constant travel of centuries has worn a gutter in the soft vegetable mold, into which drains all the surplus water of the surrounding surface. Nor is this, in our case, the worst. We must go not only where there are roads, but must visit (and not seldom) regions destitute of inhabitants and remote from the regular routes of travel. Then we must cut our own roads, foot by foot, through the jungle. But a few weeks ago, a trip of this kind, of perhaps not more than fifty miles, cost us a week of hard labor.

But while we labor under disadvantages that one unaccustomed to the tropics can hardly understand, there are redeeming features that more than compensate these drawbacks. The bad roads, or no roads, require only intelligence and energy to remedy. The climate is delicious. The summers are no where on the island as hot as we sometimes have it in New York; cold weather is unknown; the country, despite all that is constantly being said about it, is not unhealthy, and the people are honest, simple-minded and innocent, and so far as their means go, invariably hospitable. It is wonderful how an error can be perpetuated. Santo Domingo, and especially the capital, has the reputation of being a very pest-house of all the diseases of the tropics. One of the leading journals of New York city, and one whose special correspondent had just returned from this city, said, a couple of months ago, in an editorial article, that Santo Domingo city was "notoriously never free from yellow fever." I not only hereby contradict the statement *in toto*, but further assert that, after having lived in this city since February, 1869, and after having taken especial pains to make inquiries wherever I could obtain the most reliable information, I not only never saw a case of yellow fever, but further, have never been able to learn of more than one case here during several years past, and that case is extremely doubtful. In a word, the only fever I know of is a slight acclimatizing fever, which, if properly cared for, need not last more than a week, and need not confine the sufferer to his room. An emetic, a purge, and plenty of orangeade are all the remedies necessary. I have been exposed to every adverse condition imaginable—sleeping on the ground, in wet clothing; afoot in the mountains for two and three days together, wet to the skin by the showers of the rainy season; sleeping in my hammock, exposed to the dews, and, in short, undergoing exposure that, even at home, would be more than likely to produce disease, and I have never suffered an hour's inconvenience, or taken more than one dose of medicine, and that as a preventive, which I am now convinced was unnecessary.

I find that my letter is reaching such a length that it must remain an introduction to what I propose shall follow, rather than an account of anything in particular. Without destroying its miscellaneous character, however, I may yet give you a very concise description of the surface of the island and its appearance. The whole island, including the sister Republic of Hayti, is, more or less, of about the same area as Pennsylvania. The interior is mountainous; a great range, Y shaped, starts from the east end, dividing into two branches about the middle of this Republic, sending one arm out to the extremity of each of the two peninsulas of Hayti. Parallel with the northern side and adjoining the north coast, is the Monte Christo range, enclosing between the two ranges one of the most beautiful valleys I ever beheld. A spur of the southern range forms the mountainous peninsula in the southwest corner of Santo Domingo, on the borders of Hayti. The mountains are, without exception, covered with dense forests, while a portion of the level land, especially in the southeast, is made up of grassy plains. Rivers, some as large as the Schuylkill, come down to the coast, every few miles, and some of them can be navigated for twenty or thirty miles from their mouths. In fact, a superabundance of running water occurs everywhere, and in the gold-mining regions, the least trouble that the miner will meet will be scarcity of water or length of ditches.

The forests abound in valuable woods; mahogany and logwood are as common as oak and hickory at home, while, in certain regions, lignum-vitæ and fustic occupy every few rods. In my next I will tell you about what must interest you more than all this—the mines. Suffice it for the present, that the placer region is large, the gold abundant, water plenty, labor cheap, and the regions easily accessible. W. M. GABB.

Successful Co-operation.

EMPLOYERS DIVIDING PROFITS WITH WORKMEN.

MESSRS. A. S. CAMERON & CO., who occupy extensive premises in Twenty-third street, formerly known as the New York Steam Engine Works, and who are the largest constructors of steam pumps in this country, have at present one hundred and ten men employed upon this specialty, and notwithstanding the dullness of trade, are busier than they have ever been before. The great feature of this establishment is its approximation to the co-operation system which is rapidly developing itself in this country. Mr. CAMERON inaugurated the plan on the 12th of July last, and thus far it has worked admirably, giving the most perfect satisfaction to all concerned. The success which has attended it has been watched with great interest by other establishments, by which it will no doubt be adopted. The amount of capital invested in Messrs. CAMERON'S business is about $300,000, and agencies are established in all parts of the United States and in the principal countries in Europe, and large stocks are on hand at the agencies with which to supply the wants of trade. The general features of the plan are as follows: The books are balanced on the first day of July each year. On the 15th day of July, 1870, will be distributed among the workmen then in their employ ten per cent. of the net profits accruing from the business during the year ending July 1. These profits will be divided in proportion to the amount of wages received by each man during that period. To be the recipients of the dividends, the employés are to perform the duties assigned to them in such manner as to warrant the employers in pursuing such a course. The act being entirely voluntary on the part of the employers, it conveys no right to the employés to such distribution of profits, they being paid weekly wages, which are full compensation for services performed. Lazy persons have been pointed out and dismissed, and thus the interests of the hard-working men have been protected, and they will not be called upon at the end of the year to divide the fruits of their industry with sluggards. A circular was issued to the workmen at the time of the inauguration of this system, which explains it fully. It is as follows:

"The proposition to divide among yon ten per cent. of our profits realized from the manufacture of machinery—for which there is a great demand at all times and in all seasons—which is protected by a number of valuable patents, for the use of which we deduct no royalty—and drawing no salary whatever for our own services in conducting the business—and being in addition to your weekly wages, which is at least as liberal as you could secure in similar employment elsewhere, is perhaps the most encouraging offer that the employer has ever made to the employed. Bear in mind, however, that this distribution of profits will only be made on condition that your increased efforts entitle you to it. Should the rule operate to our advantage, in relieving us from following up the leaks and the loafers, we will continue it; not otherwise. If we derive benefit from the system, we can secure its adoption in other establishments; but if you do not appreciate the offer, we will consider you untrue to yourselves, to your families, and to your fellow workmen at large, and will take pains to make the fact known. What we expect in return is, that you will work earnestly and faithfully, and see that neither time nor material is wasted; that you will point out to us any labor-saving item, or other source of economy that may suggest itself to you. And above all, we expect that those who do not enter into the spirit of this matter will be pointed out to us for prompt dismissal. We have appointed from among you, to assist in carrying out this proposition, a committee of seven, who may add to their numbers as many as they see fit. We suggest that they hold a meeting at least once a month, and we give them, free of any charge, accommodations for this purpose, to consult upon the working of the scheme, and recommend to us such action as they may consider necessary on our part to its promotion. The foreman of the shop, though not appointed, is, by courtesy, a member of the committee."

A visit to the extensive workshops of the establishment shows at a glance how well the system works. The men look cheerful, are strictly attentive to their various jobs, and no idlers or skulkers are to be seen. During the busy season the men worked fourteen hours a day, and completed work which had to be delivered at a specified time. A strike is an unheard-of thing here. Professional "tramps" do not receive encouragement, and while the concern reaps a rich harvest, the employés feel sure of steady employment, regulated by a committee of their own class, with the pleasing prospect of participating in the profits of a thriving business. Mr. CAMERON is a young man, and one who has the good of the laboring classes at heart, and if the men prove faithful to their own interests, it is probable that, while benefitting themselves directly, they will produce a change in the working of other establishments which will in time be of great and lasting benefit to all craftsmen.—*N. Y. Tribune.*

MINING SUMMARY.

Colorado.

MINING REFORM.

Under this caption, a correspondent of the Denver *News* urges the managers of mines to commence a more economical system of management. He cites the following glaring instance that recently came under his observation of wilful mismanagement, needing correction. He says: "I was, a few days since, talking with one of the mining agents of this place, and on observing that he was not saving his tailings from the stamps, as is the case generally, I said to him: 'Why do you not save your tailings, as other companies do?' He said he could not make more than six dollars per ton profit on them, and he would sooner let them go into the creek than sell them for such a price. I then asked him the quantity of ore stamped in twenty-four hours, and his answer was, about two and-a-half cords, which I set down at about twenty-five tons; one-half of which could be sold at six dollars per ton, after paying all expenses. This would give him $75 per day; sufficient to keep and to pay the cost of eight men sinking the shaft, and six men drifting east and west on the course of the lode to open up ground for stoping. This statement I showed to him, but all to no purpose, and as he appeared to go on his own way I left him to his own reflections. As yet no steps are taken to save the property that is being wasted in the creek, and if mining companies entrust the working of their mines to such men as these, I do not at all wonder that they are sick of Colorado mining. I am informed that there is scarcely one agent that can tell how many tons there are in a cord, or a fathom of ground, and in order to enable them to do this correctly I append a table showing the weight of the ores generally worked in this country to the cubic foot, which I hope will be of service to all interested in mining. A vein one foot thick, six feet long and six feet high, will measure three cubic feet, and in order to find the weight of the ore therein, multiply the pounds of ore given in the table by the cubic feet in the lode, allowing a fair per centage for hollow spaces.

"A TABLE showing the weight of a cubic foot of ore in pounds and hundredths:

METALS AND MINERALS.	WEIGHT.	METALS AND MINERALS.	WEIGHT.
Gold, native	1,250.00	Red oxide	337.05
Silver	643.75	Calamite	263.75
Silver horn	287.05	Nickel, sulphuret	287.25
Copper, native	525.00	Nickel, glance	381.25
Copper, vitven	343.75	Cobalt	400.00
Copper, pyrites	259.37	Iron, native	456.25
Copper, purple	312.05	Iron, pyrites	300.00
Copper, gray	296.87	Iron, arsenical	381.25
Copper, malachite	250.00	Iron, hematite	225.00
Tin, oxide	406.25	Pitch blend, or uranium lime	404.73
Tin, sulphuret	268.75	Calc spar	150.25
Lead, native	709.37	Fluor spar	196.25
Sulphuret, or galena	468.75	Silica, quartz	162.05
Corbonate	403.75	Baryta, heavy spar	263.75
Blend, sulphuret	250.00	Carbonate, near the above	

CONTINUED SUCCESS OF THE DIAMOND DRILL.

The Georgetown *Miner*, Dec. 30, says: "The drill now at work in the tunnel of the Incas-Bullion Mining Company, in Fletcher mountain, Clinton gulch, Summit county, Colorado, is, it seems, notwithstanding the severity of the weather, making good progress. The tunnel has been driven in all six hundred and fifty feet, leaving nearly that much more to be driven to reach the lode desired. The Diamond drill was introduced for the purpose of testing the ground ahead, and began its operations, therefore, in the heading of the tunnel. The drill cuts a hole two and-a-half inches in diameter, and brings out the core, thus giving a perfectly reliable visible index of the character of rock, and presence or absence of mineral, about which nothing could otherwise be known without the actual driving ahead of the tunnel. The drill is worked by means of compressed air, sent through pipes from the mouth of the tunnel, and the same difficulty in cold weather is experienced in its use for this as for the Burleigh drill. The compressors use water as a lubricant, and the damp air, under a pressure of from thirty to forty pounds to the inch, on escaping from the drill expands so rapidly as to produce intense cold and clog the drill with ice. The latest advices from Fletcher mountain are that the drill has reached a distance of two hundred and twenty feet from the heading of the tunnel, and is making a daily progress (twelve hours) of about twenty feet. Under favorable circumstances, it is claimed that it will bore one hundred feet per day. If for no other purpose, this drill is admirably fitted at least for exploration of ground suspected to be mineral bearing. If all that is claimed for it be true, any of our tunnels will have it in their power to prove certainly and surely the nature of their property, and that, too, at a rapid rate and comparatively light expense. The tunnel in Fletcher mountain is a heavy enterprise, and one, we believe, that will be successful. The Diamond drill has disclosed the existence of four lodes in all—one of which contains six inches of sulphurets. We expect soon to hear of greater things, as that section of country is rich in mineral."

Nevada.

THE PERILS OF MINING—A SHOCKING ACCIDENT—GREAT NEED OF COMPETENT INSPECTORS.

The Virginia City, Nevada, papers of the 4th inst. give the details of a shocking accident, resulting in the death of two miners in the old Chollar mine of the Comstock lode. We reproduce the account of the *Territorial Enterprise* here, as it illustrates with irresistible force the dangers to which the toilers underground are liable, in consequence of the lack of any system of mining inspection by competent engineers: "Yesterday morning, between the hours of seven and eight o'clock, Daniel White and Charles E. Brightmore were engaged in mining in that portion of the mine in which Mr. Lynch has

a contract for extracting ore, when a cave occurred, instantly killing both men. They were engaged in taking out ore from ground which had been worked over before, and yesterday morning they were engaged at a point some seventy feet north of the shaft, about three sets of timbers above the third level, some three hundred and fifty feet below the surface. Four men went into the place to work—ex-policeman Bradley and a miner named Kelly, with the two men named, who lost their lives. The ground, from all accounts, was shaky and poorly supported by timbers. As they went in to go to work Kelly remarked that the ground appeared to be settling at the point where White and Brightmore were engaged, and Bradley also said that he thought it was going to go down, as there was considerable cracking of timbers and a perceptible downward motion. White, however, laughed at their fears, as he saw the lagging he had put in the day before all in its place. As for the cracking of timbers, miners working in such ground get used to it and pay but little attention to it, believing it to be but the ordinary settling common in such situations. White lay down upon his back and began wedging in the lagging overhead, he being at the time up within three feet of it, where he was lying. Brightmore was one set of timbers above White, when suddenly the floor under the latter gave way, and he was precipitated to the level below with a lot of logging, timbers and rock. Brightmore was heard to cry out, 'Boys, save Dan!' when he, too, with a great lot of timbers and rock, went down, and all was silent; no sound escaping from the lips of either of the unfortunate men. The wind from the cave blew out all the candles, and darkness prevailed. A spark of fire, however, remained upon the wick of Bradley's candle, and groping his way from the dangerous locality, he at last reached a niche in solid ground, where he halted, and holding out his candle, with the wick still burning, he cried out: 'Let all who are able come here; here is solid ground.' Kelly answered him, saying: 'I see your light, and I am coming to you!' While the two men stood trembling in their niche, a lighted candle was displayed at the top of a sort of chute or opening near by, used for lowering timbers, in which they could see a rope dangling. They climbed this rope to the top of the opening, and after a short stay returned with lights to look for their companions.

"The alarm was soon given above, when many miners collected about the shaft, and measures were at once taken to get out the bodies of the killed. In order to reach them without risking more lives, it was necessary to do a good deal of timbering in order to secure the ground above, and it was not till four o'clock in the evening that the body of Daniel White was taken out, and it was about half past five o'clock (mining time) when the mangled remains of Brightmore reached the surface. The bodies of the men could be seen from first to last, but to reach them without first securing the loose ground above would have been a most perilous undertaking. The bodies of both men were terribly mangled. Brightmore was found with his head jammed tightly between two timbers, with his legs between two other sticks of timber. Such was the pressure upon his legs that the two edges of the timbers met, and those laboring to recover the bodies for a long time supposed he was cut in two and so reported at the surface. White was also wedged among the timbers and covered with rocks. Charles E. Brightmore was about thirty-seven years of age, and a native of England. Daniel White was about thirty-five years of age, and a native of County Cork, Ireland. Both men were unmarried. White has two brothers and a sister living in San Francisco, California. Brightmore has a brother somewhere on the Pacific coast, and a son living in Pennsylvania, where he lost his wife some years ago. Both were men much esteemed by all who knew them, both here and in California."

AFFAIRS OF THE GOULD AND CURRY MINING COMPANY.

From the annual report of the Gould & Curry Mining Company, just issued, we extract the following interesting items: "The Superintendent reports 15,879 tons of ore taken from the mine during the year, including 6,149 tons by contract. The ore worked by the company averaged $26 30 per ton, aggregating $247,516. The mine abounds in low grade ore, which, under reduced expenses, can be worked at a profit. The main shaft has been completely repaired, and lengthened forty feet, making a total depth of 1,187 feet. Within twenty feet of the bottom of the shaft the seventh station has been opened, and drills north and south made, the former being one hundred and sixty feet and the latter two hundred feet, with cross-cuts fifty-six and fifty-seven feet respectively. From the Secretary's report we extract the following items of receipts and expenditures for the year ending November 30, 1869:

RECEIPTS.		EXPENSES.	
Bullion	$247,584 29	Mine	$204,518 99
Sales of ore, etc	38,754 56	Mill	4,858 80
Other items	44,952 19	Mill customs	101,980 88
Assessment	72,000 00	Truckee Railroad	40,000 00
Overdrawn	22,826 99	Other	73,932 37
Total	$425,291 04	Total	$425,291 04

"The subscription to the railroad has resulted in a reduction already in the price of wood from $15 50 to $11 50 per cord, and timber from $28 to $22, which is a proportionate saving of $8,000 on the year's expense. A further reduction to $9 and $18 will take place in the spring, when large existing quantities of low grade ore will pass over the road to mill, and of which the freight is already paid by the $40,000 advance to the railroad. The ore mined in the past year averaged $26 30 per ton, all from the old mine."

WHITE PINE PROSPECTS.

The San Francisco *Alta* says: "The White Pine region is turning out fairly. It is claimed that the closing of many mines there and discharging of men is not altogether in the 'bear' interest, but as a matter of economy, seeing that more has been got out than can be milled to advantage in the present posture of affairs there. The price of milling, it seems, however, is reduced from $50, last year, to $18, and it is urged that $12 will barely give a profit to the miner. In this case the average of the ore must have fallen considerably. Nevertheless a reasonable amount of ore continues to be turned out."

Michigan.

THE MICHIGAMMI IRON DISTRICT.

The Marquette *Mining Journal*, January 1, says: "It may be premature to designate the group of magnetic mines constituting the present West end of the Marquette district, together with the great undeveloped deposits at the Smith and Spurr Mountains, as a distinct mineral district. But this division must come, and it is convenient for us to suggest it now, at the same time venturing the above name. The 'Magnetic District' would be significant, and not inappropriate; but a geographical name has the advantage of fixing the locality, which is important, particularly while it is new. If we extend the principle set forth in Whitney's Metallic Wealth for the grouping of mines, something like the following would result: The Marquette Iron *Region*, divided for the present into the Negaunee and Michigammi Districts. Dr. Credner has employed substantially this grouping in his recent papers in German on the geology of the Lake Superior Iron Region. The Negaunee and Michigammi districts properly divide at the Escanaba river at Clarksburgh, the Washington, Edwards and Champion Mines, now opened, and the Smith and Spurr Mountains, known to be first class deposits, which are only waiting transportation facilities to begin shipment, constituting the latter group. The three mines last named shipped the past season about 100,000 tons of ore against 50,000 tons the year before, an increase for the Michigammi district of 100 per cent., while the whole Marquette region gained in the same time only about 20 per cent. This shows plainly that increased production must be looked for, chiefly, to the west of the old mines. We do not mean to say that there will be no increase in the production of the Negaunee District, comprising the Jackson, Cleveland, Lake Superior (old), and the New York, Marquette, Barnum, Lake Angeline, and the New England (comparatively new) mines; but do confidently predict that this increase will not exceed an average of 10 per cent. on this year's production, or, say 50,000 tons per year. This amount will not supply the increased demand for ore. We know of fifteen furnace stacks now being erected, designed to run almost exclusively on Lake Superior ore. Here alone is 150,000 tons added for next year's consumption, and 200,000 will be nearer the actua increase, for Lake Superior ores are penetrating further and further toward the seaboard, and are now being largely used in furnaces in central Pennsylvania and New York, which were built to consume an entirely different ore, produced from mines nearer at home. It is hard to say how far it will pay to transport, on favorable routes, 66 per cent. ores which produce a first quality of pig metal. With the reduction of tolls on the Erie Canal, which must come, Lake Superior ores would be largely consumed on the Hudson, their red-short qualities making them desirable to the furnace man as mixtures with the cold-short ores of New York and New Jersey. Here is a large increase of demand entirely independent of the building of new furnaces. The Marquette Iron Region can furnish these 200,000 additional tons with ease, *but two-thirds of the increase must come from the Michigammi District.* Producers, consumers and carriers of ore will do well to accept this proposition as a settled fact and act accordingly. There is one important practical inference to be drawn from these statements, which is, that the Smith Mountain or the Spurr Mountain, or both, should be opened for shipment next year. Stockholders in the old mines may not view the matter in this light, thinking that a scarcity of ore would enhance the value of their own; but we submit to such that this would be but a temporary gain, if any. If the supply of Lake Superior ore falls considerably short of the demand for one year, there will be created a panic among the consumers that will injure the trade ten times more than the possible gain above named. Iron men will not build a furnace establishment costing $100,000 to run much risk of their lying idle for want of ore. It is safe to claim that for the immediate future the Lake Superior Iron Region, if energetically developed, can supply all the iron ore needed to make up the deficiency of the rest of the United States. Its comparative importance and growth may be illustrated thus: The magnetic region of Northern New Jersey has been producing iron ore for over one hundred years. This year it furnished about 500,000 tons from about forty mines. The Marquette Region has been producing ore but twelve years, and this year supplied over 700,000 tons from twelve mines. A comparison with the Lake Champlain and Missouri regions would result quite as favorably for Lake Superior. The increased yearly consumption of iron is far greater than an article of food or clothing. Wheat, for example, is needed in quantities exactly proportionate to population. With iron the ratio is two-fold: 1st, as to the population; 2d, as iron is applied to new uses; and the last is or has been by far the greatest. For example, our Anglo-Saxon ancestors did not, in all probability, consume one pound per head per year; this amount has increased until it has become about 125 pounds per head per year, and this rate is rapidly increasing. From this it appears that, as a nation rapidly advancing in material civilization, the consumption of iron is likely to become enormous. Hundreds of new uses are only waiting for the price of iron to permit its employment."

Montana.

THE NEW GOLD DISCOVERIES ON CEDAR CREEK—INCREASED EXCITEMENT.

The excitement in regard to the recent gold discoveries on Cedar creek, reported in our last issue, is on the increase, and miners from every section of Montana are flocking to the new El Dorado. We take from files of Montana papers to Dec. 30 the following accounts of the new mines, which our readers should digest with grains of caution. Mr. Charles Cusson and the Deer Lodge *New North-West* newspaper are responsible for the following:

"THE LOCATION OF THE MINES.

"First. They are not in the Couer d'Alene range, as reported, but in the Bitter Root range. The Couer d'Alene mountains are one hundred miles distant. It is seventy-four miles from Missoula to Louisville—the new town. You follow the Mullan road fifty-two miles beyond Missoula, turn to the left, cross the Bitter Root river, and thence up Cedar creek. The last fifteen miles is a trail. It is not a bad one, and a wagon road can be easily made. There are no hills of consequence. Seven miles above the mouth of Cedar creek the north and south forks have their confluence.

"ABOUT THE MINES.

"The mines are on the south fork, the lower line of Barrett's district being one and-a-half miles above the junction. Prospecting is now commenced on the north fork, and prospects have been found. Barrett's district is ten miles square. The Recorder's office is in Discovery, eight and-a-half miles above the lower line. On December 12 one hundred and thirty-two claims had been recorded above, one hundred and three below Discovery. Districts have also been established above and below Barrett's. There are three kinds of claims—creek, gulch and bar. The creek claims are two hundred feet on the gulch, and on either side to an altitude of nine feet above the water level. Then come bar claims, and, as we understand it, the gulch claims are on the side gulches.

"THE LAY OF THE LAND.

"Discovery is up within four miles of the mountains. It is only five miles across the range to the St. Joe diggings in Idaho, where eight or ten men were working last summer. There was no snow at Discovery on Dec. 19th. Four miles above it was two and-a-half to three feet deep. Cedar creek is from twelve to fifteen feet wide. It is now flowing about four hundred inches of water, and will flow one thousand inches in the spring. It does not empty any water into Bitter Root river. Three or four miles below the forks it all sinks. The gulch is in a canyon, with rugged, precipitous sides, the hills being very high on either side. The width of the gulch varies from twenty or thirty to two hundred and four hundred feet. Throughout its entire length it is very densely timbered with cedars of enormous size, many of them having diameter of six and seven feet. The country on either side is a dense forest, with open country at the head of the gulch. The dirt is from two and-a-half to six feet, all gravel, no boulders, slate bed rock, and plenty of fall.

"DISCOVERY.

"The discovery was made by Louis Barrett and another Frenchman or two, whose names are at open hostility with English orthography. They had been prospecting for four months, and nearly three months ago opened the discovery on Cedar creek. They sunk a hole two by six feet, two and-a-half feet to bed-rock, and panned out of the hole $248. They have since abandoned this and located two and-a-half miles above, where they are washing with pans. They endeavored to keep the matter quiet until spring, but in sending out for friends, the 'strike' obtained publicity, and on the last day of November a party of stampeders left Frenchtown at seven o'clock in the evening. On the 12th, between two hundred and three hundred men remained there, double that number having gone in. Louisville had several houses just started, and men were prospecting in the vicinity. Mr. Cusson saw $5 to the pan washed out. He has considerable experience in mining. We asked his opinion of Cedar creek. He thought they were good mines. 'As good as Alder?' 'No.' 'As good as Last Chance?' 'Better.' If the reports are half true, it is wonderfully rich. The shallowness of the ground and the plentitude of water indicates rapid working—and exhaustion. But other gulches will likely be discovered, and the facility with which the ground can be worked will, with its reported richness, make money plenty, and build up a large town speedily. The ground is now laid over until May 15th, 1870."

"FURTHER INTELLIGENCE.

Says the Helena *Herald*: "The excitement is becoming more intense every day as the mines are prospected and developed. The rush to the new diggings is said to be immense, and the road from Helena to Missoula is literally dotted with eager and excited men. The intelligence which we have thus far received seems to be reliable, and as yet no discouraging reports have come to hand. We sincerely trust these gold diggings will prove to be as rich and extensive as represented. From Jo. Lomme, formerly a merchant of Helena, we learn that the new camp contains about one thousand men, and that the rush from all quarters continues unabated. Several buildings are being erected, but the process by which lumber is sawed (whip-sawing) renders it slow business. A portable saw-mill from Missoula mills was soon expected, and then building would be lively. While there Mr. Lomme saw some fine nuggets and excellent diggings, and these prospects are about as good in one place as another. He thinks it will be equal to Alder gulch in her days of glory. Dr. J. B. Buker writes from Missoula, Dec. 20: The excitement is as great as ever. Hundreds have returned from there, and all have the same report to make. All say that it far exceeds anything ever discovered in the Territory, both in extent and richness. My son has just returned from there this evening. He located claims which he thinks are very rich. He was not able to get down to the bed-rock, but the ground prospects very well, from fifteen to twenty cents to the pan. Hundreds are passing daily through here—in fact, they are going day and night. It will make one of the largest camps in the Territory. Thos. Newman writes: The excitement is very high throughout this county over the discoveries recently made some seventy miles below Missoula, which, in fact, are extremely flattering. Two men who have been working for me this fall have just returned from the diggings. One of them, whom I consider a reliable man, tells me he saw three pans of dirt washed out, and the product was $9. The creek is prospected more or less for ten miles, with favorable results. I am told the creek is from twenty-five to thirty miles long, with numerous side gulches, and some of the latter are said to look and prospect very well."

THE MINES ABOUT UNIONVILLE.

A correspondent at Unionville gives the following information regarding the mines at that place: "All the mills in this district, to the number of six, are running constantly on ore taken from the ledges owned by the several companies, with the exception of one which is doing custom work. These not being sufficient to supply the demand, your indefatigable townsman, Mr. J. W. Whitlatch will soon have another running at the head of Grizzly gulch, contiguous to the old I X L mill. The location is very judiciously selected, being centrally located between the Park and Parkinson lodes, from which it will be supplied, and both of which are No. 1 ledges, as the largest bricks which have been recently produced clearly prove. The latter is owned by Messrs. Whitlatch, Argyle, and the McClure brothers. The new mill is to be of fifteen stamps' capacity, with machinery sufficiently powerful to run thirty, which will be put in motion as soon as the mine is thoroughly opened. Messrs. Hendrie & Son are the contractors, and Mr. Alvoord the architect. The owners of the various ledges in this district have apparently more confidence in their permanency and richness than they have hitherto had, as the improvement and enlargement of their mills and hoisting works goes to show. How much better it would be for the people to conclude to stop where there is permanent prosperity than to listen to the Munchausen stories told of the fabulous wealth and quick fortunes to be made in far off Utopia, and upon their arrival to find by sad experience the whole thing to be a delusion and a mere *ignis fatuus.*"

AFFAIRS AT STERLING AND ABOUT UNIONVILLE.

A writer from Sterling, Dec. 20, complains of snow and plenty of wet weather, and adds: "Mr. N. J. Isdell has disposed of his entire mining property in Washington district for $4,100, the majority of the property falling into the hands of Parkinson, James & Co. Nearly all the old members of the Sterling Mining Company, in Norwegian gulch, have sold their interests to new parties within a short time. The Appleton mill has ceased running on account of the ice. The Midas mill shut down on Saturday night. It is hoped, however, that it is only for a short season. The Cope mill is expected to start immediately. The arastras of Sharpe & Vernoy have stopped, but those of Hapgood & Goodwin are still running."

BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

IRON AND STEEL MANUFACTURE.—CLAIM OF PATENT No. 97,897 in the manufacture of Iron and Steel, subjecting the mass of molten metal to the action of hydrogen gas alone, forced up through the mass in combination with a current or currents of atmospheric air or oxygen, introduced over the molten metal within a chamber of reflecting character, producing combustion of the carburetted hydrogen, phosphuretted hydrogen, &c., above the metal, substantially as and for the purpose specified. WILLIAM ENNIS, Patentee and owner of this process, wishes to call the attention of manufacturers to the above claim. WILLIAM ENNIS,
Jan11-1m Thirty-ninth street, north of Bridge street, Philadelphia.

GLYNN'S ANTI-INCRUSTATION FOR STEAM BOILERS.—The only reliable article for removing and preventing incrustation. No foaming, and does not attack metals of boilers. Liberal terms to agents. C. D. FREDRICKS,
Dec. 21, tf. 587 Broadway, New York.

MARKET REVIEW.

The Coal Trade.

NEW YORK, Jan. 21, 1870.

WHOLESALE.—Trade remains remarkably dull. The spring-like weather of the last few days has evidently caused buyers to give up all idea of wanting any more coal. During this cessation of business the prospects for the future of 1870 are being actively canvassed by all concerned in the Coal Trade, and a few weeks will enable us to present to our readers the movements of miners, operators, and transportation companies. Our announcement last week of the reduction of tolls from the Lehigh Region will be found authenticated in the following circular. This is the second reduction of tolls that has been made by the transportation companies this year, the Reading Railroad being the first.

CENTRAL RAIL ROAD OF NEW JERSEY.
NEW YORK, Jan. 14, 1870.
NOTICE TO COAL SHIPPERS.

The tolls on coal from Penn Haven to Port Johnson have been reduced this date fifty-seven (57) cents, equal to $2 48 per ton through, exclusive of wharfage. This rate to apply on all shipments from January 10th inst., for the month of January. The rates are divided as follows:

Penn Haven to Elizabethport, - - $1 10 per ton.
Elizabethport to Port Johnson, - - 1 38 " "
Mauch Chunk to Elizabethport, - 94 " "

SAMUEL KNOX, Secretary.

R. E. RICKER, Superintendent.

Certain parties have been anxious for some time past to make Penn Haven the prominent point of shipment instead of Mauch Chunk, and this would seem to indicate that they have carried their point. The peculiar advantage gained thereby we fail to see.

A telegram informs us that there was a meeting of the Workingmen's Benevolent Association at Hazelton yesterday, when the question of a strike on the Eight Hour Law was discussed. It is understood that if the miners could induce the Hyde Park men to join them, a strike would be arranged.

The above is only a straw to show which way the wind is blowing. The present high rate of wages cannot be maintained at the prices now obtained for coal, and a stoppage in some manner or other will be brought about. The Scranton sale announced below will no doubt show a further decline upon last month's prices; for the market is not today, and will not be next Wednesday, prepared to take 75,000 tons of coal, except at very low figures. It would seem as though we were producing more coal than the people really require, or that the high prices at which it was sold early in the season greatly lessened the amount consumed. However, be this as it may, there is 150,000 tons of coal here, and 100,000 at Philadelphia, that nobody seems to be willing to make a reasonable offer for.

The 79th auction sale of Scranton coal will be held on Wednesday next, Jan. 26, at the sales rooms, 26 Exchange Place; 75,000 tons of coal of the usual sizes will be offered.

A meeting of the Stockholders of the Wilkesbarre Coal and Iron Company is called for on next Wednesday, at Wilkesbarre, Penn., for the annual election of Directors.

RETAIL.—The retail trade has fallen off considerably this past week. The cause is attributed to the warm weather.

FREIGHTS.—Freights remain unchanged.

Our Boston correspondent writes that the stocks on hand are light; that trade generally is very dull, with no prospects of a revival soon. From Philadelphia we learn that there is a stock of 100,000 tons, and trade "very dull."

OFFICE OF THE WILKESBARRE COAL AND IRON COMPANY,
No. 80 BROADWAY, NEW YORK, Jan. 5, 1870.

THE ANNUAL MEETING OF THE Stockholders of the Wilkes Barre Coal and Iron Company, for the election of Directors and transaction of such other business as may be presented, will be held at the office of the Company at Wilkesbarre, Penn., on Wednesday, Jan. 26, at 11 o'clock A. M.

The polls will close at 1 o'clock P. M.

Transfer books will be closed from the 18th to the 27th inst., both days inclusive.

By order. S. M. WILLIAMS, Secretary, *pro tem.*

Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending January 15, 1870, compared with week ending January 16, 1869.

COMPANIES.	1869. WEEK.	1869. TOTAL.	1870. WEEK.	1870. TOTAL.
*Phila. & Reading R.R.	23,151	239,155	20,869	272,182
†Schuylkill Canal				
Lehigh Valley R. R.	40,543	284,822	43,518	308,337
Lehigh and Sus. R. R.	20,910	37,185	18,685	34,144
†Lehigh Canal				
Scranton North	9,004	19,074	12,198	25,172
" South	27,348	59,649	28,472	54,522
Penn. Coal Co., rail	14,929	31,176	17,487	35,452
† " " " canal				
Del. and Hudson, rail. n			14,034	25,648
" " " south			2,118	3,115
Shamokin	6,495	11,228	6,979	11,182
Trevorton	255	814	318	816
Short Mountain	760	1,345	700	1,300
Lykens Valley Canal Co.	967	2,580	950	2,500
†Wyoming South				
† " North				
P. N. Y. C. & R. R. Co.			3,818	21,027
Williamstown, Col'y.	1,457	2,687	4,168	‡ 7,716
Total	145,989	639,696	175,264	812,910
1870			145,989	639,696
Increase			29,275	173,215

* Less coal transported for Company's use and Bituminous coal.
† Closed for the Season.

Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Jan. 15, 1870, compared with week ending Jan. 16, 1869.

COMPANIES.	1869. Week.	1869. Year.	1870. Week.	1870. Year.
B. & O. R. R.			2,544	4,203
C. & O. Canal				
H. & B. S. R. R.		4,055		4,181
Harrisburg & D.			5,367	46,464
L. V. R. R.				1,743
P. & N.Y. C. & R. Co.			2,931	21,989
		4,055	10,492	78,580

Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending Jan. 13, 1870—less coal carried for Company's use, and Bituminous Coal:

For week	20,988 07
Previously this year	281,312 14
Total	292,181 01
Same time last year	245,714 00
Decrease	37,467 01
Amount sent same week 1868	29,750 00

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, January 13, 1870:

From St. Clair	1,917 13
" Port Carbon	2,500 15
" Pottsville	283 05
" Schuylkill Haven	6 371 05
" Auburn	490 12
" Port Clinton	8,467 16
" Allentown and Alburtis	138 13
" Harrisburgh and Dauphin	5,366 18
Total paying freight	26,235 15
Coal for Company's use	1,347 15
Total for week	27,583 10
To same time last year	316,249 06
Total	343,832 16
To same time last year	244,774 19

Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending Jan. 13 1870:

	Tons.
For week	5,266 18
Previously this year	41,006 17
Total	46,463 15

Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via. the Pennsylvania and New York Canal and Railroad Company, for week ending January 15th, 1870:

Anthracite	3,817 18
Previously this year	17,209 06
Total	21,027 24
Bituminous	2,931 00
Previously this year	19,038 00
Total	21,969 00

Report of Coal Transported over Lehigh and Susquehanna Railroad.

Week ending January 15th, 1870—Compared with same time last year.

WHERE SHIPPED FROM	WEEK, 1870. tons ct	WEEK, 1869. tons ct	YEAR, 1870. tons cwt.	YEAR, 1869. tons cwt
Wyoming Region	12008 08	12203 17	20984 09	22097 12
Upper Lehigh Region	956 04	3515 04	611 10	6435 06
Hazleton Region	98 04		243 01	159 16
Mauch Chunk Region	6020 12	5190 11	12205 02	8492 13
Totals	19085 08	20909 12	34144 02	37185 09
Increase				
Decrease	2224 04		3041 07	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	17797 01	18905 14	32812 17	34073 04
Delivered at and above Mauch Chunk	715 07	1015 18	1148 18	1849 14
Delivered to L. & B. R. R. at Plymouth Bridge	173 00	988 05	182 07	1262 10
Totals	18685 08	20909 12	34144 02	37185 09
Of the above there was from Compay's Mines.	7204 11	5190 11	13848 10	8492 13
Increase	2014 00		5325 17	

Report of Coal Transported over Lehigh Valley Railroad

For the week ending January 15th, 1870, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVL'Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	10,730 05	57,236 02	68,016 07
" Hazleton	26,089 13	140,357 03	166,446 16
" Upper Lehigh			
" Beaver Meadow	7,985 16	55,210 08	63,196 02
" Mahanoy	3,769 07	37,452 15	41,221 02
" Mauch Chunk	69 00	195 14	264 14
Total Anthracite	48,634 01	290,512 00	339,146 01
Bituminous Coal recv'd from Cats. R. R.			
N. C. R. R.			
E. P. R. R.		1,743 00	1,743 00
P. & N.Y. C. & R.R. Co			
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	48,634 01	292,255 00	340,889 01
Same time last year	40,642 12	211,494 06	252,236 18
Increase	8,091 09	80,560 14	88,652 03
Decrease			
Forwarded East from M'h Chunk by rail	43,517 14	264,819 13	308,337 07
Same time last year	40,171 02	194,651 03	234,822 05
Increase	3,346 14	70,168 10	73,515 02

RECAPITULATION.

Forwarded East from M'h Chunk by rail	43,517 14	264,819 13	308,337 07
To N. C. R. R., at Mount Carmel		115 00	115 00
Forwarded North from L. & B. Junction	3,818 08	16,799 09	20,617 17
To L. & S. R. R. at Packerton for rail	109 04	607 12	716 16
Delivered at M'h Chunk	24 16	146 15	171 11
Delivered on line of road above Mauch Chunk	215 02	1,346 01	1,561 03
Delivered above M. Chunk for use of L. V. R.R.	948 17	6,023 01	6,970 18
To L. & S. R.R., at P'n Hav., for railroad			
Do. for canal			
At M.Chunk for canal		655 09	655 09
Total Anthracite	48,634 01	290,512 00	339,149 01
Bituminous Coal		1,743 00	1,743 00
Total all kinds	48,634 01	292,255 00	340,889 01

Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Jan. 15, 1870, were as follows:

From Georges Creek via Piedmont.	Tons.
Consolidation Co	447 11
Borden Co.	105 11
Balt. & Hampshire Co.	459 06
Maryland Co.	
From Eckhart R. R.	
C. C. & I. Co.	1,523 05
Total	2,543 14

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

	AT NEW YORK, Jan. 21, R. A.	W. A.	AT PHILADELPHIA, Jan. 20. R. A.	W. A.
SCHUYLKILL.				
Lump	$- —	$5 00	5 50	5 25
Steamer	- —	5 00	- —	5 00
Broken	- —	5 50	- —	- —
Egg	6 75 to - —	5 50	- —	5 00
Stove	7 00 to - —	6 75	- —	5 25
Chestnut	5 50 to - —	5 00	- —	4 25
Pea	- —	6 75	- —	- —
LEHIGH.				
Lump	- —	7 10	- —	- —
Steamer	- —	- —	- —	- —
Broken	- —	6 60	- —	- —
Egg	- —	7 60	- —	- —
Stove	- —	8 10	- —	- —
Chestnut	- —	6 10	- —	- —
Pea	- —	- —	- —	- —
SPECIAL COALS.*	R. A.	W. A.		
Diamond Vein	- —	6 60	- —	- —
New England	"	- —	- —	- —
Locust Dale	W. A.	6 00	- —	- —
Honey Brook, Le'h	W. A.	5 50 to 6 25	- —	- —
Spring Mount	" "	5 50 to 6 25	- —	- —
Sugar Creek	" "	5 50 to 6 25	- —	- —
Sugar Loaf	" "	5 50 to 6 25	- —	- —
Fulton	" "	5 50 to 6 25	- —	- —
Stout	" "	5 50 to 6 25	- —	- —
Old Comp'y's.	" "	5 50 to 6 25	- —	- —
Cross Creek	" "	5 50 to 6 25	- —	- —
Chauncey	" "	- —	- —	- —
Girardville	" "	- —	- —	- —
McMichael	" "	- —	- —	- —
Shamokin	" "	6 50	5 75	- —
Lykens Valley.	" "	- —	- —	- —
Broad Top	" "	- —	5 00	- —
Hill & Harris	" "	- —	5 75	- —
Henry Clay	" "	- —	6 00	- —
Powelton	" "	- —	5 50	- —

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cst.
Lehigh	$3 50	$4 00	$4 00	$4 00	$4 25	$3 75
Wilkesbarre	3 50	4 00	4 00	4 00	4 25	3 75

For freight to Elizabethport and to New York see "Freights."

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein...f.o.b. at Phila.	$5 25
Lemon " "	5 00
Cumberland C. & I. Co.'s on board	N. Y. 7 50
Central C. & M. Co.'s "	" 7 50
Consolidated Coal Co.'s "	" 7 50

[*Dealers in these coals may be found in our advertising columns.]

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton at E. Port	—	—	—	—	—	—
Pittston at N. Y	6 30	6 30	6 40	6 40	7 25	6 10
Lackawana at Weh'kn.	5 50	5 75	6 00	6 00	6 50	5 50
Wilk'b're at Hoboken.	5 50	5 75	6 00	6 00	6 50	5 50
Old Co. Lehigh at Pt. Johnston	6 75	6 00	6 00	6 00	7 25	6 50
Lehigh at E. Port	6 25	5 50	5 50	5 50	6 25	5 25

For freights to different points, see "Freights."

Prices of Foreign Coals.

January, 1870.
Duty $1 25 per ton.
Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" Cannel	13 00@14 00
" House	14 50@17 50
" Orrel	14 00@16 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@18 00
" Cannel, "	18 00@19 00

Per ton 2,000 lbs., delivered.

Prices of Gas Coals.

January, 1870.

PROVINCIAL.

Duty, $1 25.	Coarse. Gold.	Slack. Gold.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75
Lingan	1 75	@- 75
Sydney	2 13½	@- 71½
Pictou	2 13½	@1 18¾
Little Glace Bay	1 50	@1 00
Caledonia	1 50	@- 75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co	- —	@- —
Despard Coal Co	$8 50	@8 00
Penn	- —	@- —
Newburg Orrel Gas	- —	@- —
West Fairmount Gas Coal	- —	@8 00

AT PHILADELPHIA.

Powelton	$7 80

Prices at Baltimore—Jan. 1870.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$7 75@7 90
Pittston and Plymouth	7 50@7 75
Shamokin Red or White Ash	6 75@7 00
Lykens Valley Red Ash	7 30@7 55
Trevorton, Red Ash	6 75@7 25
By retail, per ton of 2240 lbs. delivered	8 25@8 50
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	—@5 00
West Fairmount Gas f. o. b.	—@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

January, 1870.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$- —@- —
Lykens Valley	- —@- —
Shamokin Red or White Ash	- —@- —
Trevorton and Zebra Valley	- —@- —

Freights.—JANUARY, 1870.

TO EASTERN PORTS.	From Philada.	From E. Port and Port Johnston.	From Newburg.	From Rondout.
Stamford	$2 00	$1 10	$	$
Norwalk	2 25	1 15		
Bridgeport	2 00	1 10		
New Haven	2 25	- —		
Hartford	2 75			
New London	2 00	1 40		
Norwich and Sou	2 00	1 50		
Mystic	2 00	- —		
Stonington	2 00	1 40		
Sag Harbor	2 90	1 10		
Bristol	2 50	1 40		
Newport	2 50	1 40		
Fall River	2 50	1 40		
Providence	2 50	1 40		
Dighton	- —	- —		
Warren	- —	- —		
Pawtucket	2 25	- —		
New Bedford	2 25	1 40		
East Cambridge	3 00	- —		
Salem	3 00	2 00		
Newburyport	3 10	2 00		
Portsmouth, N. H.	3 35	2 00		
Rockport	- —	- —		
Saco	3 00	2 00		
Portland	3 00	2 00		
Bangor	3 00	- —		
Bath	3 00	2 00		
Middletown	- —			
Amesbury	3 25	- —		
Boston	3 15	2 00		
Cambridgeport	3 00	- —		
Taunton	3 10	2 00		
Derby	2 00			
New York	1 75	50		
Hackensack	1 25	- —		
Jersey City	1 75	50		
TO RIVER PORTS.				
Troy	- —	- —		
Albany	- —	- —		
Coeyman's	- —			
Stuyvesant	- —			
Cocksackie	- —			
Hudson	- —	- —		
Catskill	- —	- —		
Poughkeepsie	- —	- —		
Fishkill	- —	- —		
Cold Spring	- —	- —		
Haverstraw	- —	50		
Nyack	1 60	50		
Sing Sing	1 60	- —		
Yonkers	- —	40		
New York	- —	- —		
Saugerties	- —	- —		
Rhinebeck	- —	- —		
Rondout	- —	- —		
Tarrytown	1 60	80		
West Point	- —			

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 00
From Port Carbon, 8 cents per ton more.	
MAUCH CHUNK TO ELIZABETHPORT.	
L. V. Railroad from Mauch Chunk to Easton	$ 94
C. R. R., N. J., Easton to Elizabethport	1 38
Shipping expenses at Elizabethport	10
Wharfage	
Total	$2 67

MAUCH CHUNK TO PORT JOHNSON.

L. V. R. R., or L. & S. R. R. from M. C. to Easton	$ 94
C. R. R., of N. J., Easton to Pt. Johnson	38
Shipping expenses	25
Wharfage	10
Total	$2 67

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Easton	$ 94
Morris & Essex R. R. Easton to Hoboken	1 38
Shipping expenses	25
Wharfage	10
Total	$2 67

TO SOUTH AMBOY.

L. V. R. R.	
R. & D. R. R.	1 28
Cam. & Am. R. R.	
Shipping Expenses	25
Total	$2 47

PENN HAVEN TO ELIZABETHPORT.

L. V. RR. Penn Haven to Easton	1 1 0
C. RR. of N. J. Easton to Elizabethport	1 3
Shipping expenses	2
Wharfage	1
Total	$2 8 3

Foreign and Provincial Freights.

January, 1870.

Foreign.	
Newcastle and Ports on Tyne	£15@£17 keel
Liverpool	15s. —, do
TO NEW YORK.	
Provincial	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25
TO BOSTON.	
Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

	Store Prices.
Pig, Scotch No. 1, ₱ ton	32 00@34 00
Pig, American, No. 1	34 50@35 —
Pig, American, No. 2	— —@34 —
Pig, American, Forge	— —@32 —
Bar, Refined, English and American	80 00@82 50
Bar, Swedes, assorted sizes (gold)	80 00@82 50
	Store Prices.
Bar, Swedes, ord'y sizes, less 5 ₱ ct.	120 —@130 —
Bar, Refined " "	85 —@ — —
Bar, Common " "	— —@ 80 —
Scroll " "	110 —@135 —
Ovals and half-round " "	110 —@ — —
Band " "	110 —@ — —
Horse Shoe " "	110 —@ — —
Rods, ⅛ to 3-16 inch " "	90 —@140 —
Hoop " "	115 —@160 —
Nail rod, less 5 ₱ ct.	— 8—@ 8½
Sheet, Russia, as to Nos. (gold)	— 11—@12—
Sheet, Single, D. and T. Common	6½@— 7
Sheet, Galvanized	List 15@25 ₱ cent. discount
Rails, English (gold), ₱ ton	56 50 @57 00
Rails, American, at Works in Pa.	76 00 @77 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 16 @— 20
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 11 @— 18
English Machinery	— 11½@— 14
English German (2d and 1st quality)	— 13 @— 15
American Blister "Black Diamond"	— 10½@— 16
American, Cast, Tool do.	19 — @— —
American, Spring, do.	— 10 @— 13
American Machinery, do.	— — @— 13
American German, do.	— 10 @— 13

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 32
Copper Bolts	— @— 33
Copper Braziers, 16oz. and over	33 @— 35
Copper Nails	38 @— 40
Copper, Old Sheathing, &c., clean	18 @— 19
Copper, Chili Pig	— @— —
Copper, American Ingot	21¾@— 21¾
Yellow Metal, New Sheating	— @— 26
Yellow Metal Bolts	— @— 26
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2¼ cents ₱ lb.

Galena, ₱ 100 lbs.	$— — @— —
Spanish (gold)	6 25 @6 37½
German, do.	6 50 @6 37½
English, do.	6 25 @6 75
Bar (net)	— — @ 8 00
Pipe and Sheet (net)	— — @ 8 00

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

	Gold ₱ lb.
Banca	32½@32½
Straits	31½@31½
English	29¼@29¼

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ₱ box	$8 00 @8 25	$10 25 @10 75
I. C. Coke	6 75 @7 37½	8 50 @ 9 50
Coke Terne	— — @6 00	7 50 @ 8 00
Charcoal Terne	7 25 @8 00	9 25 @10 25

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

	Gold.
Plates, Foreign ₱ 100 lbs.	$6 00 @6 12½
Plates, Domestic ₱ lb.	10 @- 12

REMARKS.

IRON.—The market for Scotch Pig remains quiet, but, as there is no disposition to press sales, prices are supported; 250 tons Eglinton sold at $32 50, and some small lots at $33. American is inactive, and prices are unsettled, no sales having transpired since our last. There is a moderate inquiry for Wrought Scrap, and we notice sales of 200 tons on private terms. New Rails are in moderate request at $56 50 @ $57 gold for English, and $76 @ $77 currency for American at the Works in Pennsylvania. There is no change in Refined Bar from store, our quotations being the nominal prices. Southern Plow sizes Swedes Bar, are nearly out of market, and would command a considerable advance on previous quotations.

COPPER.—Manufactured is without change. Ingot has been in better demand, and, with a larger business, the market has more tone than before; sales have been made of 450,000 lb. Lake Superior, Baltimore, and Tennessee, at 21½ @ 21¾ cents, including a little for future delivery at 21½ cents.

TIN.—The demand for Pig is chiefly in a jobbing way at 31¾ @ 31½ cents for Straits; 29½ @ 29¾ cents for English, and 32½ @ 32¾ for Banca; 300 slabs Straits sold at 31½ cents, short time, and five tons English at 29½ cents, all gold. In Plates there has been more business, and sales have been made of 1,000 bxs. assorted Charcoal Tin at $8 25 for I. C., and 1,000 do. 14 by 20 I. C. Coke, $7, gold.

LEAD.—Since our last the market for Pig has been very quiet; prices, however, are unchanged. Bar, Pipe, and Sheet eight cents, net cash.

STEEL.—All descriptions are dull at old figures.

ZINC.—American, dry, 7¼c.; French, dry, 10½c.; Metallic, 10½c.

MANGANESE—5½c. per lb.

Mining Stocks.

NEW YORK, Jan. 20, 1870.

Prices are a shade below last week's quotations. Quartz Hill sells freely at 73 cents and Gregory, s. 3, at $1 90. The market generally is dull.

The prices of Petroleum stocks are well sustained. In many instances a considerable advance will be noticed upon comparing our report of this week and last.

	Bid.	Asked.
Bennehoff	20	—
Bergen Coal and Oil	25	45
Bliven Oil	—	1 00
Brevoort	1 00	—
Buchanan Farm	38	40
Central	60	70
Clinton Oil	—	3 50
Home Petroleum	5 00	6 00
National	—	—
New York and Alleghany	1 75	—
Northern Light	60	70
Pithole Creek	—	—
Rathbone Oil	20	—

Rynd Farm	40	50
Second National	—	—
Sherman & Barnsdale	—	—
United Petroleum Farms	20	—
United States	75	85

San Francisco Stock Market.

SAN FRANCISCO, January 15, 1870.
(By Telegraph.)

	1st Board.	2d Board.
Savage	45¾	46¾
Crown Point	13¾	13¾
Yellow Jacket	55½	55½
Kentucky	1 33	1 34
Chollar Potosi	19½	20
Gould & Curry	—	—
Ophir	14¾	14¾
Alpha	—	—
Belcher	16	—
Imperial	—	—
Hale & Norcross	1 60½	1 63
Amador	—	—

The Geology of Lake Michigan.

FROM an interesting paper prepared by Professor EDMUND ANDREWS, President of the Chicago Historical Society, on "The Geology of Lake Michigan," we give the following synopsis: He had long been convinced that sufficient indications existed on the lake shore to determine the distance of the drift period. Lake Michigan had its currents like the ocean, one passing northerly and the other southerly. Lake Michigan lies in a basin of boulder drift, which lies again in a basin of rock. The shores were rapidly being eroded by the force of the waves and the peculiar character of the basin. The sand is swept by currents along the shore, and no sand is ever brought up from the depths of the lake. There is a constant current passing along both shores, and the influence of this incessant action leaves what he would call, for want of a better term, a terrace of erosion, which drops with perpendicular abruptness to the great depth just beyond the action of the currents. The shelf on the western shore of Lake Michigan was about the same depth with that of the eastern shore of Lake Huron. This he attributed to the force and prevailing course of the lake winds. It it were possible to find out the rate at which this erosion proceeded, it would be practicable to get at an approximative estimate of the time taken to form this shelf. In Lake Erie, in front of Cleveland, the formation of the terrace was about six feet per year, and in other places it was only four feet. The average rate between Evanston and Manitowoc was about 3 98-100 feet a-year. The breadth of the shelf and the extent of the erosion was about 3 98-100 miles on the lake shore.

The general slope of the bottom showed from soundings that the shore had been contracted about two and three-quarter miles. An estimate would indicate that about 2,807 years had elapsed in the process of the erosion. Lake Michigan had stood at three levels, the first one about forty-two feet above the present level. There was no well-defined beach line above that already indicated between the lake and the Alleghany Mountains. The result of the recession of the waters from drift period was that the water was shut up in the basins as in cups. If we examine the beach lines, they are found in three parallel sets. That the change of the levels was quite sudden is indicated by the fact that the beaches were not disturbed. The water subsided in the lower part of the lake first, as the peat beds overgrown with moss, forest, and underbrush in the vicinity of Evanston must have been formed after the first recession of the waters.

The Iron Trade in Europe.

THE iron business appears to be exceedingly active in England, and in the principal iron regions of the continent. Advices from Prussia state that the blast furnaces, although running to their full capacity, can scarcely supply the demand for pig iron. There is scarcely a ton of pig on hand that is not sold or bespoke; considerable quantities are being imported from England and Belgium. The market for iron bars continues in a very animated state, and the rolling mills are scarcely able to produce the quantities of iron ordered from them. Manufacturers stipulate for extended periods in connection with new deliveries. The market for rails maintains a favorable appearance. Large orders have been placed during the past few weeks. The production of steel is increasing rapidly in Prussia; many works that have heretofore produced iron rails only, are now preparing to make cast-steel rails, which are at present more in demand than iron ones.

Removal of Blossom Rock, in San Francisco Harbor.

THE work of excavating Blossom Rock, to the end of its early and utter demolition, is proceeding with satisfactory dispatch. Several notable shipwrecks have been caused by this impediment to the free, safe navigation of our harbor, and its removal will be of signal commercial benefit. Colonel VON SCHMIDT, the contracting engineer, has been eminently successful so far, with every probability of a complete and early triumph. The rock has been found to be soft, readily yielding to the pick, and rendering the use of powder quite unnecessary, until the final shattering and destroying blast. A huge excavation, to the depth of twenty-two feet, reaching well out toward the sides of the rock, has already been made, leaving, comparatively, a shell to be removed by powder. The terrible storm which raged on our coast on the night of the 24th, did not damage the works in the least. Two men were in the coffer dam the whole of that dreadful night, but experienced neither discomfort nor alarm. As the works passed through that ordeal without injury, it is altogether probable that they will stand any future assault of the elements. When a sufficient depth and area have been reached, five thousand pounds of California-made gunpowder (not blasting powder) will be placed in well secured iron receptacles, perfectly water-tight, and connected by wire with each other and the exploding galvanic battery. These powder magazines are to be placed to the best advantage, and so surrounded as to give their simultaneous explosion the greatest and widest lateral force. The water is then to be let in as the last tamping, and Blossom Rock will be wiped out of existence, and thousands will look upon its terrific demolition with delight.—*San Francisco Commercial Herald.*

More Curiosities Exhumed.

THE Oil City *Times* says that two laborers, who were engaged in making an excavation about half a mile north of West Hickory, preparatory to erecting a derrick, exhumed an enormous helmet of iron, which was corroded with rust. Further digging brought to light a sword, which measured nine feet in length. Curiosity incited them to enlarge the hole, and after some little time they discovered the bones of two enormous feet. Following up the "lead," in a few hours' time they had unearthed the well-preserved skeleton of an enormous giant, belonging to a species of the human family, which probably inhabited this and other parts of the world at that time of which the Bible speaks, when it says: "And there were giants in those days." The helmet is said to be of the shape of those found among the ruins of Ninevah. The bones of the skeleton are remarkably white. The teeth are all in their places, and all of them are double, and of extraordinary size. These relics have been taken to Tionesta, where they are visited by large numbers of people daily. When his giantship was in the flesh, he must have stood eighteen feet in his stockings. These remarkable relics will be forwarded to New York early next week. The joints of the skeleton are now being glued together. These remains were found about twelve feet below the surface of a mound, which had been thrown up probably centuries ago, and which was not more than three feet above the level of the ground around it. Here is another nut for antiquarians to crack.

A Novel Steam Engine.

A WASHINGTON paper states that a steam engine, operating on a novel principle, has been successfully at work in that city for over two years. It is operated upon the principle of reaction and direct action, both at the same time. The reaction-wheel is simply a hollow shaft, having two or more hollow arms; steam issuing from opposite sides of these arms, causes them to revolve by force of reaction or unbalanced pressure. Just outside the hollow arms is a wheel, having buckets on the inside of its rim. This wheel is hung upon a shaft in line with the hollow shaft. The steam, after exerting its full power of reaction upon the hollow arms, strikes the buckets and forces the outer wheel in the opposite direction. The power of both wheels is used in driving machinery by means of one cross-belt.

These engines have been tested by long and hard usage, and have proved themselves equal to the best piston-engines in economy of fuel. The great points gained by this engine are diminished cost, simplicity, less liability to get out of order; can be set up without an expensive foundation, and operated without a skilled engineer. A ten-horse power weighs but three hundred pounds, and costs, complete, (without boiler) $400. These engines, it is said, have been examined and tested by a large number of government and other engineers, who have, almost without exception, pronounced them superior to any in use for stationary purposes.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st.	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col.	P. P. Fullerton, 71 B'way.	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada.					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00	10	12
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00		
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Central Union Gold					15	25
Consolidated Gregory	Colorado				1 90	1 95
Combination Silver	Nevada			100 00	1 50	
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5,000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado.	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col.	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff,MonoCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson, 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E.	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					17	21
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col.	P. P. Fullerton, 71 B'way	1,000,000			
Lander Hill T. & S.	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold					2	3
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		8½	8⅝
Mariposa preferred	California	do. do.			16⅞	17⅛
Montana Gold		G. De Cordova	400,000			
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal.	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000		5	
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M.		W. H. Mailler, 108 Wall				
Ophir Gold	Comstock Lode, Nev.	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,700,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		72	74
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000		67	69
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00	5	6
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000		1 00	
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M.	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 90	2 00
Social & Steptoe Con.		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					45	75
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co.		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co.		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co.		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co.		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co.		E. Kissan, 90 B'way	5,000,000		31½	32
Derby Coal Co.		W. S. Davison, 11 Broad				
Dover Coal and Iron Co.		L. Chase, 88 Wall				
Del. & Hudson Canal Co.			10,000,000	100 00		
Ebervale Coal		G.L. Stout, Treas., 111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co.		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co.		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co.		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C.	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co.		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co.		J. H. Rolston, 80 B'way	1,000,000			
Lehigh & Susquehanna					85	1 35
Mahanoy			400,000	100 00		
McNeal C. & I. Co.		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co.		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co.		G. Wrighton, 34 Wall				
Peekskill Iron Co.		W. Murdock, 7 Nassau				
Pennsylvania Coal Co.		C. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co.		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co		I. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		G. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co.		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co.		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper					3	25
Eagle Harbor Copper	Michigan.	W. H. Smith, 43 Ex. Place.	500,000	25 00		
Evergreen Bluff Copoer	Michigan	F. W. Caper, 44 Ex. Place.	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			7
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co.		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P.	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st,	1,000,000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Fly, 191 B'way	500,000			
Wallkill Lead, asst		S. M. Pond, 70 B'way			4	5

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co.		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co.		H. Bogardus, 14 Pine				
Quicksilver					14½	15
Covill B. L. M. & M'f. Co		C. B. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co.	New Jersey	A. H. Parlin, 61 Maiden L'e,	1,500,000			

Science and the Daily Press.

IT is sad to see how contentedly the conductors of the metropolitan dailies allow science and art to be unrepresented or misrepresented on their editorial staffs, while they take pains to secure for finance, history, literature, law, religion, and, above all, politics, the best-trained minds and pens. In some of these departments, the ability of the daily press is matter for wonder. When we consider the pressure of haste under which most editorials are written, it appears marvellous that they so often manifest acuteness, accuracy and breadth of view. Certainly the most obscure daily in the country would be disgraced if it confounded a registered with a coupon bond, or Charles the First with Charles the Second, or a knight with an earl, or an injunction with a verdict, or a ritualist with a Catholic, or a party with a "ring." Yet distinctions much wider than these are ignored in science and art by journals which nevertheless maintain a high reputation.

Criticism upon pictures and statues is notoriously either trivial, malicious or venal. The nearest approach to impartiality generally observable in the daily papers, consists in the utterance of a certain number of ugly things, and the counterweight of an equal number of sweet things. The picture under discussion is "crude" but "conscientious;" or it is "deficient in atmosphere," but "full of color;" or it is "tricky," but "powerful;" or it is a "charming bit of nature," but "painty;" or it is "Frenchy," or "pre-raphaelitic," or "Turneresque," with certain faults in "manner" or "handling" or "tone" or *chiaroscuro*. In short, art-critics seem to do little more than sling slang. But they have, at least, a certain command of the technical terms; and their verdicts, though not particularly discriminating, are not absolutely unintelligible.

Science, however, fares much worse. Scientific books are never fairly reviewed, unless they are of sufficient supposed importance to be put for the purpose into competent hands, outside of the usual editorial corps. Of this we should not, perhaps, complain. It is indeed a small evil, compared with the practice of employing ordinary reporters to furnish accounts of new machines or inventions, and of scientific lectures. Once in a while, these gentlemen audaciously take up a book—generally only to puff it, as that course is not likely to provoke an exposure, from some injured party, of their ignorance.

The editor of this paper recently delivered a lecture in Troy, which was noticed in kind and flattering language by the press of that city. It may seem ungracious to find fault with comments so generously conceived; but the fact is, that the compliments bestowed upon the speaker were awfully annihilated by the attempted report of portions of the speech. Passages like the following were quoted: "The vibrations caused by light and color are so slow as to be perceptible to the eye and not to the ear; and the vibrations caused by sound are too rapid to be perceptible to the eye, but can be heard by the ear." Man and Brother! after embalming a victim for posterity with such stuff as that, you cannot bring him to life again, nor make him comfortable in his grave, by murmured flattery over his mangled corse!

But we will turn to more striking illustrations. The New York *Herald*, a journal which does not lack the means to procure whatever talent it may require, and is in fact noted for shrinking from no expenditure deemed necessary to maintain its eminence, gave on the 9th instant a brief report of a lecture at the Cooper Union, by Professor EBITT, on Animal Life. The distinguished lecturer is represented as saying that "the difference between the animal and vegetable kingdoms consists in the fact that the former is organic, and the latter generally inorganic!" The New York *Times*, still more recently, made a similar botch of a lecture by Professor DOREMUS—an offence all the more aggravated, since the substance of that gentleman's lectures ought to be by this time as well known to the community as it is to himself.

In the same number of the *Herald* with the report we have noticed, was a tremendous puff, under the title, "A Coming Scientific Cataclysm," of a trashy, sensational book, the author of which, though not recognized as a scientific man, is pronounced by the critic "an accomplished astronomer." The book itself, which we do not care at present to dignify with an analysis, is one of those productions which periodically appear, and seem to indicate a sort of lunacy, like that which shows itself in regard to perpetual motion in mechanics, or the Second Advent in religion. The phenomenon is familiar to men of science. Every five years or less, some one starts up, whom much learning (and little knowledge) has made mad, and attacks all received scientific theories, not understanding them, nor the wide basis of collected facts on which they repose. These hot iconoclasts make no distinction between demonstrated laws, and hypotheses which are still on trial. They often arise from some secluded corner, where they never had an opportunity to learn the facts, to say nothing of the arguments and deductions, relating to the notions they propound.

We could name scores of such authors. There is SEMEYNS in Holland, who denied the theory of the compass-needle; LAS CASAS in Spain, who denied the revolution of the earth, and had a new theory of seasons and ocean-tides (similar to the one now puffed in the *Herald*;) LE MERCIER in France, who denied the Copernican system; AZAÏS in Paris, who, because he did not understand the Newtonian theory of gravitation, attacked it in a series of lectures and publications. In our own country, there are ASA SMITH and LAWRENCE BENSON, butting against the principles of Euclid, JOHN A. PARKER overhauling the established theory of magnetism, and Dr. HALL trying to talk the electricity out of the Aurora Borealis, with a throng of doughty inventors, who are constantly "revolutionizing" (we believe that is the word) the sciences of physics and chemistry, and who rush, head down, at stony facts, upon which they repeatedly spatter their brains, without seeming to produce any particular effect, on either the facts or themselves.

All this sort of books, lectures and inventions are sure to be puffed in the daily papers. A thorough discussion of tides or gravitation would find no competent critic there; but let a fool deny gravitation, and Bohemian pens leap from their inkstands, either to laud him as a daring thinker, or, more frequently, with covert satire, to characterize his maudlin utterances as "important," and to insinuate that on all such points, the "doctors disagree."

The *Saturday Review*, commenting with deserved severity on the recent starving to death, by a committee, of a deluded girl in Wales, shows that the source of the crime was a lack of faith in science. Respectable people half-believed that this girl was living without food, and they deliberately killed her, by taking measures to prevent all deception, and so find out what they never should have doubted, whether the connection between food and life is vital. This lack of faith in established truths pervades society; and the press is responsible for much of it, since the incompetence of ordinary editors to distinguish between science and charlatanry leads them to take refuge in a good-natured mixing together of both. Our weeklies and monthlies are far in advance of the dailies in this respect; and it affords us a slight consolation to add, that our press as a whole is rather superior to that of England. In the latter country, there is an amount of nonsense, even in so-called scientific journals, calculated to astonish any intelligent reader. We may, on some future occasion, illustrate this assertion with comic and tragic quotations.

Origin of the Polytechnic Club of New York City.

SEVERAL years ago, there existed in the City of New York an association called the *Mechanics' Institute*, of which nearly all the members were practical men, uniting for the mutual advantage to be gained by combined action. This society possessed a somewhat extensive technological library, some philosophical apparatus, and several models of machinery, all accessible to the members and used by them. Weekly meetings were held, of which the late Dr. MAPES, so well known for his efforts in scientific agriculture, or agricultural chemistry, was the leading spirit. In these meetings some practical subject was treated—for instance, iron or wood—every member contributing some of his knowledge to increase the stock of his fellows; and in this manner many valuable suggestions and novelties came rapidly before the industrial world. Unfortunately, Dr. MAPES, towards the close of his life, like the late Dr. HARE, of Philadelphia, though full of bodily health and vigor, became so weak of mind as to be bewitched with the operations of spiritual "mediums." He believed in their supernatural powers, became a spiritualist, and turned the weekly meetings of the Mechanics' Institute into silly exhibitions of table-tipping, knocking and rapping; and it was only by the efforts of less impressible men, such as Mr. A. ROGERS, Dr. VAN DER WEYDE, the late Professor VALE and others, who successfully exposed the trickery and deceit, practiced in every case, that this course was stopped, and the legitimate objects of the society were re-established.

Meanwhile, this course, as well as the changes in residence and circumstances of members, and perhaps more than all, the competition of the weekly meetings of the Polytechnic Club of the American Institute, which, in fact, was an outgrowth of the above, caused the Mechanics' Institute to decline; and as it could not pay its expenses, so that, in 1859, it had largely run in debt, Mr. PETER COOPER came forward, paid the debts for the remnants of library and apparatus, and incorporated both in the Cooper Union, founded by him, and just then opened. This was the end of the Mechanics' Institute; and its successor, the Polytechnic Club of the American Institute, being the only association of the kind in the city, flourished for several years.

But it is with associated enterprises as with individual ones; as soon as great success is observed, rivalry springs up. A new association was formed, called the American Association for the Advancement of Science and Art, holding meetings similar to those of the American Institute and occupying rooms in the same building, namely, that of the Cooper Union. This association made a good hit, in the first year of its existence, by engaging Professor AGASSIZ, then just returned from his trip to Brazil, for a course of lectures, which, notwithstanding the liberal fees to the professor, was so profitable that it kept the society on its legs for a few years, when it gave up the ghost, after attempting another course on Comparative Anatomy, by Dr. LEMERCIER, of Paris. This course turned out a great loss to all concerned, principally becaase Dr. LEMERCIER is so little acquainted with our language that it was painful to witness his embarrassment for only fifteen minutes, and almost impossible to suffer it a whole evening. Scarcely anybody could understand him at all. The course was even repeated, in hope of better success; but this unreasonable hope was disappointed.

So the American Institute stands again triumphantly alone, and the Polytechnic meetings, every Thursday night, are crowded. A principal cause of this success, however, is the happy choice which has been made by the Institute in selecting Professor TILLMAN as the presiding officer. This gentleman is especially fitted for the delicate duties devolving on the officer charged with the guidance of this peculiar association. If we take into account that, in this club, every person, even though not a member, but only an occasional visitor, is given freedom of speech for what he has to say on the subject under consideration, it is clear that a difficult duty has frequently to be performed, when politeness and good sense are severely taxed, to keep every one in good humor, and at the same time to protect the audience from the vapid or tedious speeches in which many persons are apt to indulge.

Security against Accidents in Mines.

CLEVELAND, Ohio, January 13, 1870.

TO THE EDITOR: Sir—In your notice of Mr. HOWE'S resolution, respecting the safety of mines, in JOURNAL of December 28, you touch a subject of great moment. I agree with you, that it is extremely doubtful if those frightful accidents which are becoming so common, especially in coal mines, can be prevented by Government inspectors. This system has been of some value in the case of steam boilers, but has not amounted to a protection.

As the States cannot, or will not, afford protection, it seems to be admitted that this duty devolves upon the general Government. Pennsylvania has for many years had the subject under consideration in her Legislature, in reference to her coal mines, and has hitherto neglected to pass the necessary laws. The general Government is not only more competent, but is the only authority which is universal, and can thus establish uniform regulations. No State or city has been able to secure its citizens against the dangers of *defective flues*. There is scarcely a daily paper issued that does not bring to notice fires caused by defective flues—a fault that is wholly due to carelessness in builders. In this city, I see from my window a cumbrous and costly smoke-stack protruding from the roof of a new and very expensive school building, which had been occupied only a few weeks, before it took fire. Several hundred children were endangered, the school closed, and workmen put to rebuild this stack, like that of a great manufactory, regardless of architectural proportions, but necessary to safety. The architect maintains that the end of a joist may be safely put in a chimney, with only one brick, of *four inches* between it and the flue. It was from joists placed in this way that this building took fire. Another equally expensive school-house in this city has shown such signs of burning that a new smoke-stack has become necessary; and in Pittsburgh an equally expensive school building has been recently burned through the agency of a defective flue. In our case, the Board of Education, the City Council, the architect, and the contractor have all, thus far, evaded responsibility. Cases are known of fires resulting from joists placed *two* bricks, or *eight* inches, from flues; yet, in this instance, the margin of protection was only one-half that distance, though the lives of several hundred children were involved; and all the parties, under our laws, are likely to escape. The laws intended to prevent coal-oil and powder explosions are equally inefficient. There are provisions in regard to nitro-glycerine, which, however, are principally precautionary. What I desire to propose, is such legislation on the part of the Federal Government as shall embrace all these causes of danger, and shall make negligence, especially in the opening and ventilation of mines, a *criminal offense*, to be tried in the courts of the United States.

Is not this the most simple, direct, and efficient mode of reaching at once all these evils, which have become too great to be much longer overlooked? C. W.

[In the article to which our correspondent refers, we have put on record our opinion that the Federal Government is *not* the proper party to interfere in the details of the management of mines; and there is nothing in the above letter to alter that opinion. The fact that the present United States laws with regard to steam boilers, etc., are not executed, can scarcely encourage us to recommend more laws. What we want is more public feeling. The laws will spring out of that. Our correspondent's suggestion, that violations should be made criminal, would be barren of result if juries did not convict; and juries will not convict until the people, as well as the law, consider the offense a crime. We are obliged to our friend for the facts he communicates, and hope he will continue to assist us in keeping the matter before the public.—ED.]

Explosions of Nitro-Glycerine.

IT is positively affirmed by M. JOUGLET, a French chemist, that nitro-glycerine, however carefully and well prepared, is subject to spontaneous alteration, whereby it becomes acid and disengages gas. This theory may explain the cause of the frightful disasters that have occurred from time to time by the explosions of this compound. It is most dangerous to store or to transport, and therefore, when the use of it is found desirable, it should be manufactured near the spot where its agency is required. The English Government possessed this knowledge before the adjournment of the House of Commons in August last, and leave was asked to introduce a bill to compel the manufacture of this subtle compound near the place of its use; and, if it did not pass, in all probability it will during the next session of Parliament; and we think that a similar precaution should be taken by our own Legislature.—*N. Y. Insurance Journal.*

White Pine.

WE are glad to hear that Mr. ALEXIS JANIN (a younger brother of the two mining engineers of that name, so widely known and respected on the Pacific slope,) has entered into partnership with Mr. LIEBENAU, the assayer and mining engineer, of White Pine, and that the firm of LIEBENAU & JANIN are prepared to make assays, examine and report upon mines, erect smelting furnaces, and in general undertake all business in the line of chemistry, mining, or metallurgy. Both these gentlemen are graduates of Freiberg, and enjoy an honorable reputation. Our personal acquaintance with one of them justifies us in cordially recommending them to parties who may stand in need of their services.

The Sutro Tunnel.

THE friends of this enterprise will be glad to learn that the tunnel is being pushed forward with great rapidity. As will be noticed in our mining summary report of the Comstock mines this week, it is already in four hundred and forty-five feet. All sympathizers with legitimate mining are friendly towards this enterprise.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

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GEO. E CUMMINGS *is our Agent at Philadelphia. Office,* 429 *Chestnut street.*

WESTERN & COMPANY,
Publishers and Proprietors,
37 PARK ROW,
NEW YORK CITY.

P. O. Box, 5969.

Publishers' Notice.

Bound copies of Volume VIII., containing THE ENGINEERING AND MINING JOURNAL from July to December, 1869, are for sale at this office, until further notice, at $4 per copy. The price, as our readers are aware, is usually advanced as the copies grow scarcer; and we would therefore advise all who intend to keep a complete set of the JOURNAL, to send in their orders at once.

WESTERN AND COMPANY.

The Restoration of Silver Currency.

THE pamphlet of Mr. DU BOIS, a portion of which we discussed last week, contains a second part, devoted to the subject of restoring a silver currency. The author begins by considering the proper function of silver, which he pronounces to be subsidiary. In this position he is sustained by the best judgment of political economists, who are almost unanimous in the opinion that there should be but one standard of value, and that gold, while silver coinage should be fixed at a relative value beneath its market-price as bullion, so as to prevent its exportation or disappearance in the arts. At the same time, the subsidiary coinage should be legal-tender for small amounts, and (as we shall show) its intrinsic value should not be too much below its face.

Mr. DU BOIS recommends that silver coins should be kept at standard fineness, but reduced in size. So far as we can see, his reason for adhering to the fineness is the desire to avoid the wearing out of the coins, and the dirty, ill-smelling results of corrosion, so common in the debased tokens of some European States. But he would make a startling reduction in the intrinsic value, offset only by a limitation of the issue. The significant point of his plan is the claim that a coinage, such as he proposes, could be put and kept in circulation with gold at 130, and would not need to be withdrawn when gold should fall to par. In a word, Mr. DU BOIS proposes a silver token coinage, not to be recalled when general specie payments are resumed. He would limit the issue to one dollar *per capita* of population—which is about the volume of the existing postal currency.

The value of these coins would be, according to the plan, about 70 per cent. of their face, and they would be legal tender only for amounts less than two dollars. Before commenting upon these features, we remark, that the subjects of international coinage, and of the weight of gold coins, are not directly involved; though we do not think they can be ignored in this connection. Mr. DU BOIS claims that his scheme will fit equally well with the RUGGLES, or the ELLIOT, or the DUNNING plan.

He settled, last September, upon 70 per cent. as about the intrinsic value of his coins, because gold had stood for three years at 132 to 140. But gold has since fallen to the neighborhood of 120; and the special appropriateness of the figures he selected is therefore gone. He might still adhere to them, however, on the plea that such a token coinage would not be disturbed by possible future fluctuations in the value of our currency, resulting from our last or from some other war. This argument would be valid, but for certain objections to the very great reduction of intrinsic value which it proposes. If our currency were at par to-day, probably not even Mr. DU BOIS would propose to issue silver half-dollars worth only thirty-five cents. One great objection is the premium offered to counterfeiters—amounting to a clear profit of 43 per cent. on the cost of the metal. Ordinary counterfeits of coins are not very dangerous; because it is usually the metal, as well as the stamp, which is imitated. But, under this plan, a counterfeiter could circulate pieces of standard silver, as good as that furnished by the government, and realize large profits. Mr. DU BOIS does not ignore this objection; but his arguments against it do not seem to us conclusive. The one upon which he most strongly relies is the fact that the nickel five-cent piece, which is only worth about three-fourths of a cent. in metal, and as much more in labor, is not counterfeited to any extent. He forgets the great difference in the labor of the counterfeiter, who would have to pass four or five nickels at a profit of three and a half cents on each, to gain as much as he would from one half-dollar at a profit of fifteen cents.

We should prefer for the weight of the half-dollar, before any of the figures suggested by our author, 10 grammes, or 154 grains, or 220 of the proposed new centesimal grains. This would make the coin worth intrinsically about three and one-half cents more, and would be, to that extent at least, an additional protection. It would also give us a metrical weight for common uses, the convenience of which could scarcely be overestimated.

Mr. DU BOIS slightly passes over a most important element in the problem—namely, the necessity of purchasing the metal required to manufacture his coins. The "profits on the coinage," which he makes quite prominent, could not equal the "profits" from the present postal currency, which is worth nothing intrinsically.

Mr. DU BOIS, who really understands what he is talking about, chooses not to say that his plan involves an outlay of $24,000,000 gold; and the Director of the Mint, who does *not* understand what he is talking about, says in his late annual report, with amusing pomposity and innocence: "To supply the country at large with a new silver currency, would be a vast and important business. Not less than one dollar for every inhabitant would meet the necessity. *But we are ready to do it,* with such allowance of time as would not be felt to be an unwise or unnecessary delay."

Those journals which have been urging the immediate adoption of this plan also seem to be ignorant of the fact that the present postal currency cannot be replaced with a metallic one, unless the United States is ready to pay the cost of the metal. Putting the question in this light, we think the ardor of the New York *Times* and other newspapers may, perhaps, be slightly cooled. Shall we reduce the taxes for 1870 twenty-five millions, or shall we tax ourselves that amount for the sake of getting a token-coinage as really, though not as far, below its face in value, as our present "stamps?" Would it not be well to wait a little? Our solid silver is at a discount in Canada, and commands but a small premium here. A further fall of ten per cent. in gold will bring back our quarters from Canada, and a still further decline will recall our dimes from Central America. But whether they return or not, the postal currency can only be removed by being redeemed. Mr. DU BOIS' proposition is nothing more nor less than to commence specie payments at once, by redeeming at a discount the postal currency, which is not a "promise to pay," while we decline to redeem the Treasury notes, which are a "promise to pay."

It may be said that the postal currency could be redeemed in greenbacks, and the new coinage issued in its place, in the way of regular payments from the Treasury. That might deceive the Director of the Mint, but the effect would be the same. Thirty-five millions of postal currency called in and destroyed; thirty-five millions of payments (which might have been made in the said postal currency) made in a coinage, the metal for which costs the government twenty-four millions in gold. This amount of gold would be enough to maintain specie payments on at least sixty millions of Treasury notes. We cannot, therefore, see the wisdom of putting Mr. DU BOIS' plan, or anything similar, in execution just now.

The Well in Prospect Park and the Ridgewood Engines.

THE Brooklyn *Eagle* attacks us for having spoken of the new well in Prospect Park as "so far as known, the largest in the world." From its somewhat hazy article on the subject, we infer that it desires to say: (1.) That there is a larger pump-well at the Ridgewood works; (2.) That if the ENGINEERING AND MINING JOURNAL is right, the well in the Park is a political outrage; (3.) But this well and water-works cannot surely be compared with that at Ridgewood, from which three of the largest steam pumping engines in the world raise daily twenty million gallons of water into the city reservoir, through pipes a yard in diameter, and nearly a mile in length, up to the crown of the hill on which the reservoir stands; (4.) That if it can be so compared, it is as large a usurpation as it is a well; (5.) That it isn't, etc.; (6.) That if it is, etc., and so on, to the peroration, which happens to come on one of the *ifs:* "But if, as we judge the fact to be, the well and water-works in the Park are but a flea bite compared with the vast engineering works at Ridgewood, then the ENGINEERING AND MINING JOURNAL has made itself ridiculous in the eyes of its Brooklyn readers, and has forfeited its character as a scientific authority, by the exaggerated eulogy it has bestowed upon what is, after all, but a small feature among the engineering achievements of the City of Brooklyn."

If we should call some editor or other the biggest donkey in Brooklyn, we could hardly be proved in the wrong by the fact that some other editor, who was not a donkey, was bigger. Nobody has asserted the Park well to be larger or more important than the Ridgewood water-works, which have no well at all. The pumps at Ridgewood lift only surface water, from a system of ponds and small streams. If the name of well is applied to any part of the works, it is to a small, comparatively shallow basin, with water-tight lining, into which the water flows from the ponds, and which has no subterranean supply whatever. At Prospect Park a well was sunk to reach water; and as this well is fifty feet in diameter, and we never heard of any exceeding it in this respect, we called it the largest in the world. The same opinion has been expressed by the *Times, Scientific American,* and other New York papers. The *Eagle,* with its boasted enterprise, should have been the first to find it out; but, having been caught napping in regard to the Park well, it does not better the matter by betraying utter ignorance of the Ridgewood water-works also.

The pump at the Park well is one of WORTHINGTON'S, raising one million of gallons one hundred and eighty feet in twenty-four hours. As these three Ridgewood engines raise each fifteen millions of gallons to the same height in the same time, there could not, of course, be any comparison between the two localities; though the disparity scarcely justifies the *Eagle* in pronouncing the one a "flea-bite" to the other. The Ridgewood engines are justly a subject of pride to the citizens of Brooklyn; but they are not by any means the largest in the the world. We propose to illustrate this statement by a few figures, after which, perhaps, the *Eagle* will condescend to be a little proud of the Prospect Park well, which, though it is unfortunately nothing but a well, yet, in that station of life, can't be beat.

The following is a comparison between the Ridgewood engines and those now employed in pumping water from the Haarlem lake, in Holland;

	Brooklyn.	Haarlem.
Diameter of cylinder, feet	7½	12
Length of stroke, feet	10	10
Number of pumps to each engine	1 or 2	8 or 11
Diameter of pumps, feet	3	6 or 5
Water lifted per stroke, gallons	1,000	20,000
Horse power of each engine	400	500
Height to which the water is lifted, feet	170	17

In the above table, the pumps of the Ridgewood engines are put at 1 or 2 in number, and three feet in diameter. In fact, Nos. 1 and 2 have each two pumps, and No. 3 has one double-acting pump. The actual effect in displacement of water is about one thousand gallons per double stroke in each engine. The whole diameter of No. 3 pump is fifty-one inches; but the plunger, which regulates the displacement of water, has only three feet diameter. Each Haarlem engine drives eight pumps of six feet, or eleven of five, delivering in each case twenty thousand gallons per single stroke, but none on the return.

The Haarlem engines, being able to displace seven hundred and fifty million of gallons in twenty-four hours, would entirely empty the Ridgewood reservoir in about five hours. They only raise the water, however, seventeen feet; and therefore they do not show so great an excess of horse-power as these figures would, at first glance, seem to require. At Haarlem the engines are not, as at Ridgewood, under the same roof; but each steam cylinder, with its eight or eleven walking-beams, communicating motion to the pumps, is placed in the centre of a separate circular building, the walls of which support the fulcrums of the walking-beams, while the pumps are disposed around the circumference, outside.

Illustrated descriptions of the Haarlem engines, and of the new and splendid engine recently built for the Ridgewood Works by Messrs. HUBBARD & WHITTAKER, of Brooklyn, will shortly appear in this JOURNAL.

The Keweenaw Peninsula.

THE articles of Dr. HERMANN CREDNER, of Leipsic, the conclusion of which we published last week, give a clearer and more comprehensive view of the deposits of native copper of the Keweenaw mines than anything that we remember having previously read. Those of our readers who have followed the author's demonstration, will have noticed that he first describes the general topographical and geological character of the peninsula, and defines the relations of the copper-bearing rocks. He then proceeds to consider the precise manner of the occurrence of the copper in those rocks, classifying it under four modes:

1—Completely or partly filling the amygdules in the amygdaloid; 2—As accidental constituent of the epidote rock which lies in irregular beds between the layers of melaphyr; 3—As cement, or accidental constituent of the gritty cement of a felsitic porphyry-breccia occurring between the melaphyrs; 4—Filling the fissures which intersect the melaphyr.

This classification he illustrates with careful descriptions of four typical deposits—not, however, exactly representing the above variety; since, in numerous cases, several methods of occurrence are combined at one mine. Of these four mines, two, the Copper Falls and the Cliff, are pronounced fissure veins. The Calumet-Hecla deposit is a bed of felsitic breccia; and the Concord an intercalation of epidotic rock.

There is very little theorizing or drawing conclusions, and no unnecessary display of learning, such as characterize the over-hasty or over-conceited observer. We recommend the calm, "objective" style, and thorough systematic structure of these articles to the study and imitation of young geologists.

New Publications.

THE SCIENTIFIC PRESS: *An Illustrated Journal of Scientific and Industrial Progress, Mining, Farming, and Mechanic Arts.* Vol. XX., No. 1. January 1, 1870. San Francisco: DEWEY & Co.—We welcome the first number of the new year of this our contemporary, whose indefatigable efforts to promote the intellectual progress of the working classes, reflect credit upon the Pacific slope. The price of the *Press* has been reduced, and is now equal to that of this JOURNAL. We wish the enterprising proprietors a great increase in the list of subscribers, as a consequence. They say they intend to make it a *live* paper; and they have already succeeded. Besides sound editorials on leading industrial topics, every number contains an amount of information worth many times the price of subscription for the whole year.

Non-Porous Castings.

OUR contemporary, the *Scientific Press* of San Francisco, says that if the plumbago crucibles, in which copper is melted, be first lined with pipe-clay, and dried, non-porous castings may be obtained, and that it is the presence of the carbonaceous matter of the crucible in contact with the melted copper which causes the sponginess of castings made in the ordinary way.

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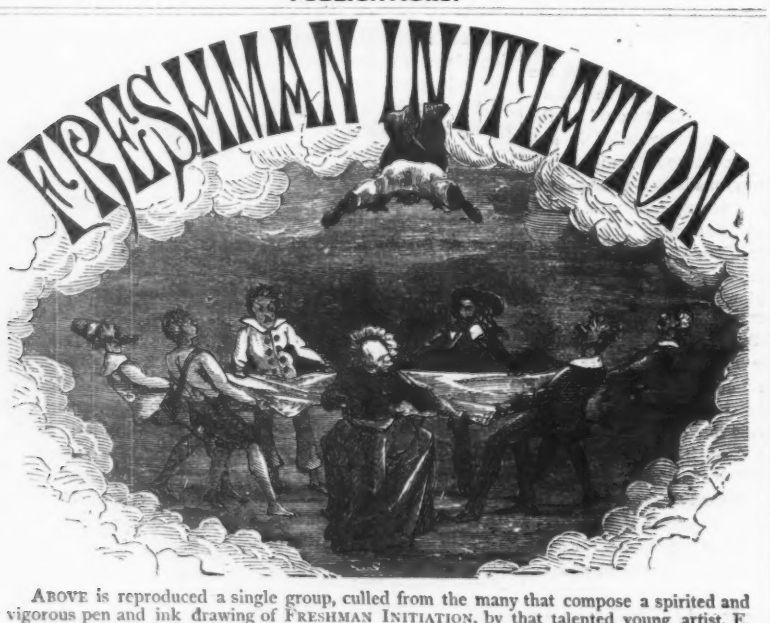

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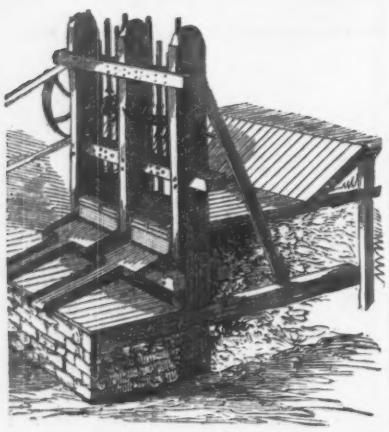

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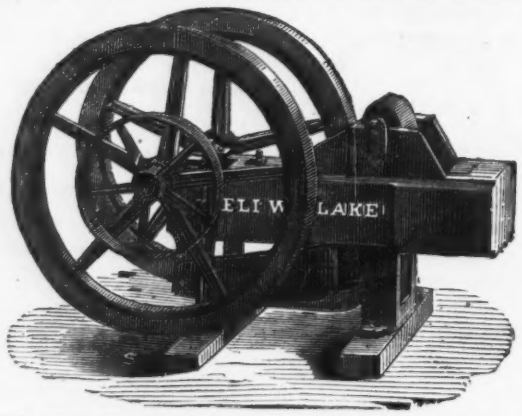

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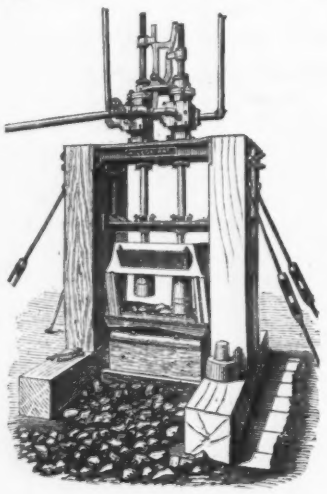

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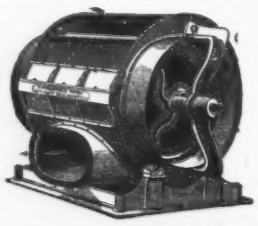

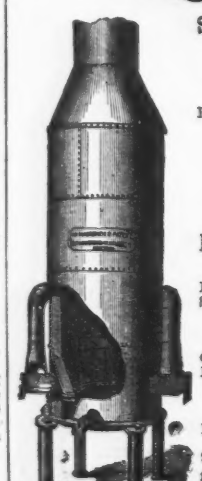

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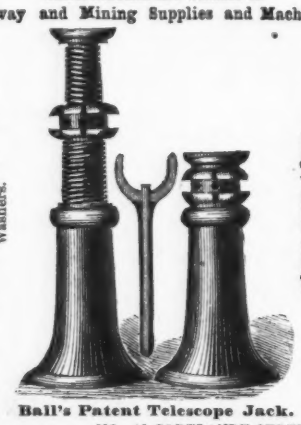

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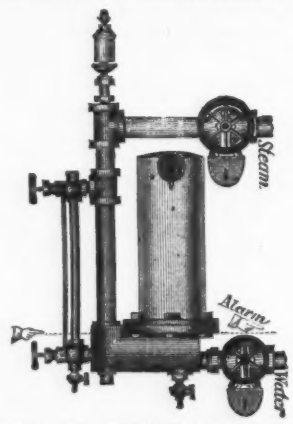

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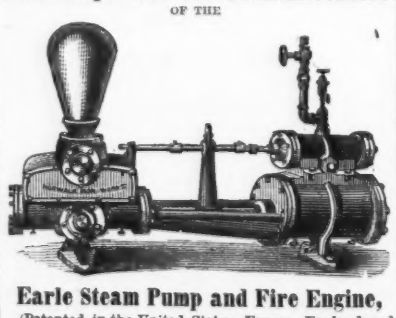

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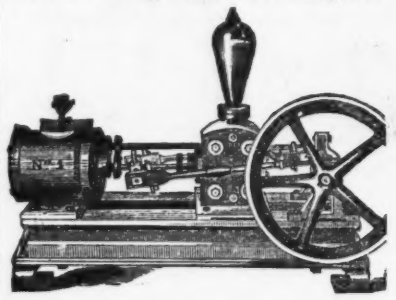

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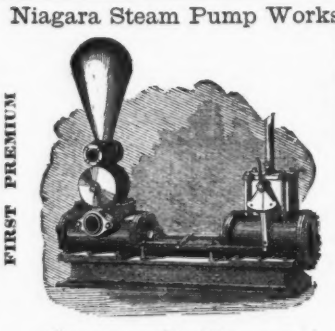

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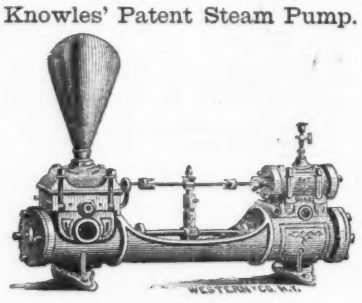

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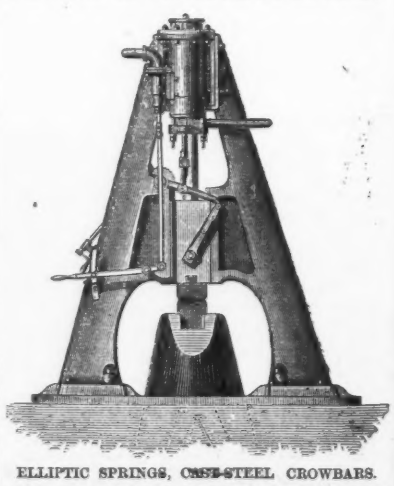

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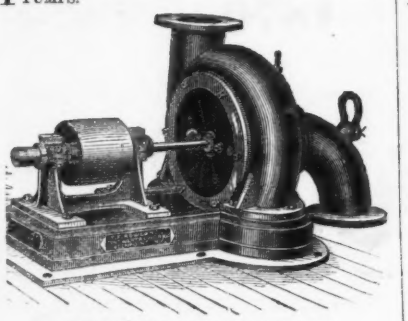

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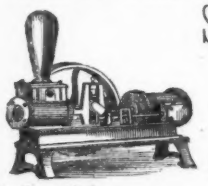

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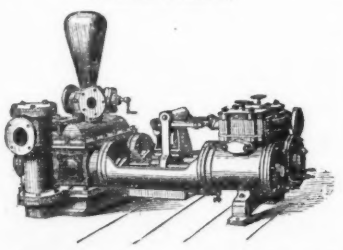

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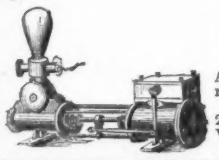

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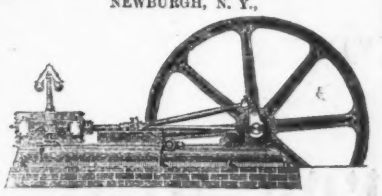

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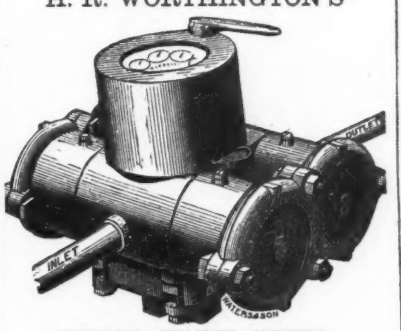

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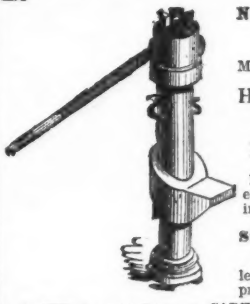

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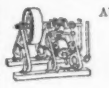

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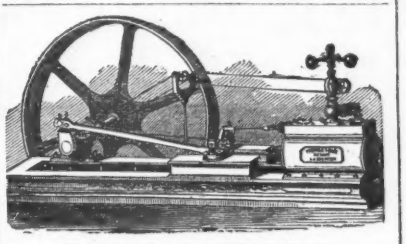

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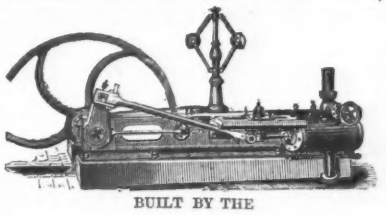

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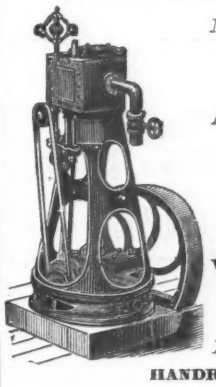

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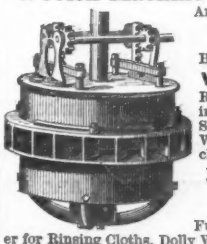

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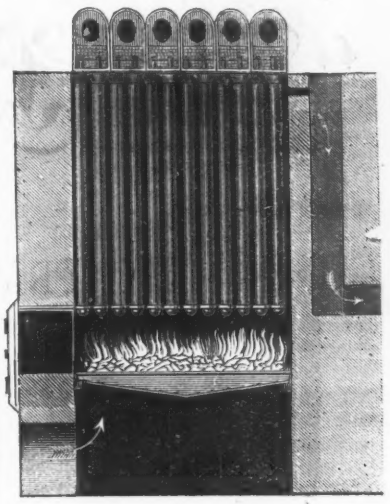

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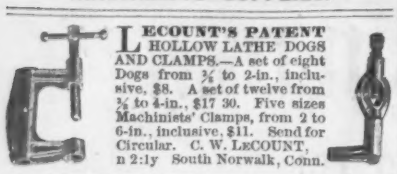

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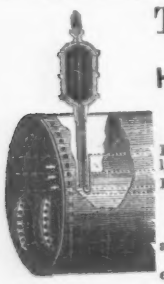

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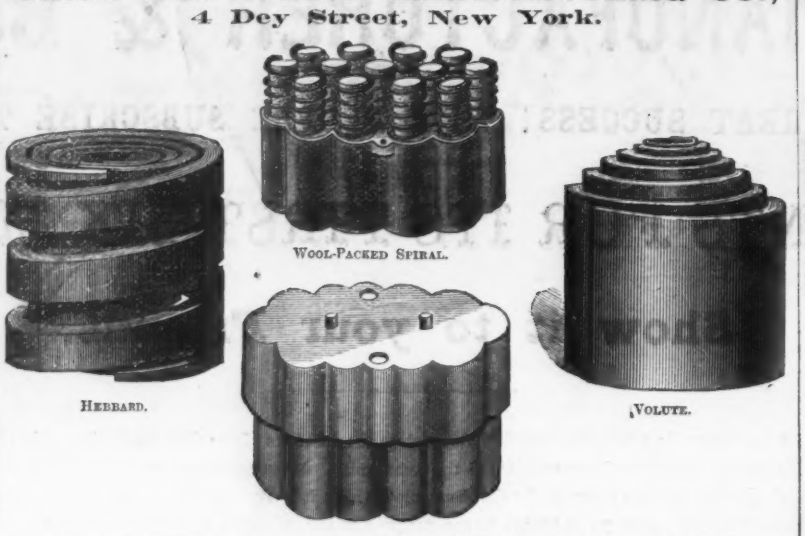

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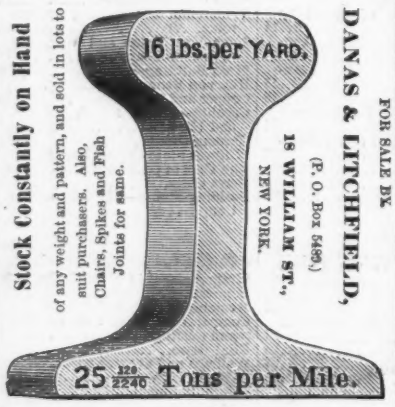

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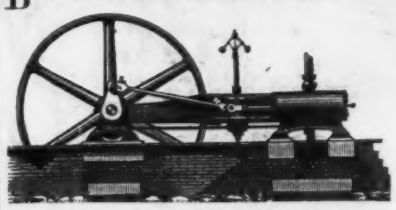

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